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SYMPOSIUM ON HEMORRHAGE

HEMORRHAGE IN PULMONARY DISEASE.*

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Pulmonary hemorrhage occurs in two forms: (1) Broncho-pulmonary, in which blood is poured into the bronchi and expectorated, and (2) Pulmonary infarction, in which hemorrhage takes place into the air cells and lung tissue.

Hemoptysis or the spitting of blood from the lungs and bronchi may vary from streaks or small clots to a dram or more in quantity which is then considered a hemorrhage. In early disease the bleeding is apt to be from a capillary vessel, but in later stages the destructive disease process may affect a larger vessel wall and the bleeding becomes more serious

Pulmonary hemorrhage starts, as a rule, suddenly, and often, without warning, the patient experiences a warm salty taste as the mouth fills with blood. Coughing is usually induced and the quantity of blood varies. An especially large hemorrhage occurs when a large blood vessel is eroded or an aneurysm bursts, causing the patient to show signs of suffocation after a few coughs, and death may result from inundation of the bronchial system. The blood is usually alkaline, frothy, and mixed with mucus. The clots contain bubbles and sometimes blood moulds of smaller bronchi may be seen. It is rather characteristic that small clots are expectorated at intervals for 24 to 48 hours after hemorrhage from the lungs. In severe bleeding the outlook is, of course, serious; but when the bleeding is moderate or mild the immediate safety is not so much to be feared as the complications causing the spreading of disease or pneumonia.

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The history in these cases is exceedingly important and examinations should be made with the utmost care.

The causes of hemoptysis and broncho-pulmonary hemorrhages are fairly numerous; however, the larger number fall into the group of uncommon causes.

Common causes of blood spitting are:
- Pulmonary tuberculosis.
- Bronchiectasis.
- Infarction.

Less common causes are:
- Abscess and gangrene of the lung.
- Pneumonia—especially the influenzal type.
- Cardiac decompensation with pulmonary congestion.
- Tumors of the lung.

Uncommon causes are:
- Trauma of the chest.
- Foreign bodies in the bronchi.
- Aneurysm of aorta eroding through adjacent structures.
- Angioma of larynx.
- Ulceration of larynx.
- Rupture of hydadid cyst of the lung.
- Syphilis.
- Purpura hemorrhagica.
- Scurvy.
- Hemophilia.
- Leprosy.
- Actinomycosis and other fungus diseases of the lung.
- Pulmonary distoma.
- Vicarious menstruation.

Large and fatal hemorrhage is uncommon, but

when it occurs it is usually due to one of three causes, i. e., the rupture of an aneurysm, tuberculosis, or maligancy.

In tuberculosis, the one above-named disease in in which the patient usually knows well the possibility of hemorrhage, there is a constant dread of its occurrence. However, the lives terminated by hemorrhage in tuberculosis are only 1 to 5 per cent of the caseous-pneumonic type. Bleeding is most apt to occur where there is tuberculous cavitation. The cavities may be thin-walled, punched-out holes in relatively unchanged lung tissue, associated with early tuberculous infiltration, and due to quick liquefaction in the infraclavicular region where a well-circumscribed area of caseous pneumonia has formed. It is in this case that the patient may have a small hemorrhage and this be the first time that he is conscious of having any definite trouble,—hence has come in for earlier treatment. These offer a better prognosis than those with the thick-walled cavity which is the most dangerous scource of pulmonary hemorrhage. Here, an aneurysm of the pulmonary artery may form through the destruction of the layers of the blood vessel walls by the caseating process and the pressure within the lumen of the vessel results in the stretching of the vessel into a thin-walled sac which a slight cough is sufficient to rupture. Hemorrhage in pulmonary tuberculosis also occurs without cavitation when, by cough or irregular respiration, there is caused a rupture in the rigid unelastic tissue in productive, indurative tuberculosis. Again it occurs where there is perifocal hemorrhagic exudation and where the tuberculous ulceration in bronchi erodes branches of the bronchial arteries. Where a bronchial lymph node caseates and causes gradual erosion into the trachea or bronchus, the caseous material may be aspirated, resulting in a small cavity from which a sudden and unexpected fatal hemorrhage may occur in an apparently healthy individual.

In bronchiectasis the damage and subsequent weakening of the bronchial walls, probably by nonspecific infection, results in the damage also to the adjacent blood vessels, and hemorrhage follows. And in infarction the bleeding occurs into the lung tissues, causing further injury with bleeding into the bronchial system.

Diagnosis of pulmonary hemorrhage is often difficult and must be distinguished from bleeding from the upper respiratory passages and hematemesis. Careful inquiry and inspection will nearly always distinguish these. Although it is a satisfaction in hemoptysis to know the exact extent of the consolidation and cavity formation, it is unwise to make use of any methods except inspection and careful auscultation with patient passive, until the hemorrhage is over and danger of recurrence seems past. A bedside X-ray, if available, may be very helpful.

The patient seen during or immediately after a pulmonary hemorrhage of moderate or severe degree presents a distressing picture, that of a pale, cyanotic, dyspnoeic, apprehensive individual who speaks with great effort while gasping for breath. The signs on physical examination vary with the extent of the involvement and the size of the hemorrhage. On inspection, the chest on the affected side may show some limited expansion. If one dares to percuss this chest ever so lightly, one finds dullness of varying degree and extent. On auscultation one finds large, mucous, gurgling rales over the trachea and larger bronchi which practically obliterate all other sounds. Breath sounds vary from diminished to absent, depending on the degree of obstruction to aeration or to the thickness of the pleura, or there may be increased breath sounds, even bronchial in type with pectoriloquy of voice sounds over areas of cavitation.

Death may result from hemorrhage causing suffocation, or due to loss of blood from a cachetic individual, or by causing rapid spreading, galloping disease by spilling over into the bronchial structures the blood containing infectious material which is disseminated by aspiration.

In most cases hemoptysis needs no special treatment, as bleeding is seldom marked, but where the bleeding is appreciable in amount there are many details of treatment employed, each small in itself but, in aggregate, of vast importance to the welfare of the patient.

Treatment of pulmonary hemorrhage consists chiefly of an attempt to quiet the patient and relieve anxiety, thus in turn lowering the pulse rate and blood pressure, lowering the toxicity, and relieving the dyspnoea, all of which tend to decrease the bleeding and to lessen the possibility of recurrence. The patient is advised to rest quietly in a semi-recumbent posture, and he may be more comfortable lying on the affected side. Talking or making any effort is discouraged. Quiet and relaxation tend to reduce the respiratory excursion by diminishing

the expansion of the chest. Morphine sulphate, gr. 1/8 to 1/6, is given if the patient is unduly alarmed or if bleeding is excessive. This helps to prevent cough, though care should be taken to prevent obliterating the cough reflex. It also aids in preventing disturbing the coagulum and wipes out the anxiety—again helping to control the dyspnoea. An ice-bag may be placed on the chest, as this has good psychic effect. Crushed ice is fed slowly. If blood pressure is elevated, nitrites are given by inhalation and nitroglycerine is given by mouth when indicated to lower blood pressure and often enough to keep the pressure at as near a constant level as possible. Fresh cool air should be circulating in the room and the room should be in an isolated or quiet place. Where high blood pressure persists and hemorrhage is severe, venesection has been employed with great caution, but this procedure is rarely undertaken. Auto-transfusion may be accomplished by bandaging the arms and legs when bleeding has been profuse. Various hemostatics have been used: calcium gluconate intravenously; fresh rabbit, horse or human serum are given intramuscularly; ergot and pituitrin subcutaneously, and thromboplastin intramuscularly. Saline cathartics in small doses are prescribed. The diet is restricted to non-stimulating foods, soft or liquid.

Bleeding usually ceases spontaneously except where there has been an erosion or rupture of a larger vessel. Where bleeding is long-continued or frequently repeated, pneumothorax will control it more promptly and more certainly than any other measure. These patients are advised to remain quietly in bed until every trace of blood has disappeared from the sputum and, if possible, until examinations are completed and diagnosis determined, so that further treatment may be advised. Though hemorrhages may be small and infrequent, this is no assurance for the future; hence, every case should be looked upon as of serious importance. A physician is guilty of negligence who allows a patient with hemoptysis to follow his usual physical activities. Careful nursing is more important than drugs in the treatment of these cases, so that the requirements for the best results of treatment are obtained when the patient is put in a quiet room with a nurse or attendant who is "deft of hand, light of foot, and optimistic of temperament." After hemorrhage has ceased, complete rest is advised and treatment for secondary anemia is begun with care as to diet and iron is prescribed. If successful penumothorax is given, then a rapid return to normal diet is advised. Calcium gluconate or lactate, 10 grs., is given after meals with twenty drops of viosterol, also cough sedatives when indicated.

The presence of blood in the sputum is always an important sign from a diagnostic standpoint but is seldom in itself of great clinical importance. It is most important to proceed as rapidly, as is in keeping with the safety of the patient, to determine the cause of the hemorrhage and its location in order to institute the proper and selective treatment in order to stop the hemorrhage when necessary and if possible to prevent further bleeding in the future.

Pneumothorax treatments are given in all suitable cases of severe pulmonary hemorrhage if possible. It may be impossible to give satisfactory collapse by this method, due to adhesions preventing collapse of the diseased areas. Where the bleeding is found due to tuberculosis, disease in the contra-lateral lung is not a contra-indication to the use of collapse therapy in selected cases, as this often improves during treatment. For severe and recurrent hemorrhage, if pneumothorax is impossible, then a phrenic crushing or a phrenico-exeresis may be done on the affected side. If this step is not sufficient, then an apicolysis may be done, or for more extensive collapse a thoracoplasty is the treatment of choice, provided the lesion is such as to otherwise necessitate extensive collapse. Blood transfusions are usually necessary. Thoracoplastry will extend a fair chance of marked improvement, if not for a symptomatic cure, to a large proportion of patients for whom there is otherwise no hope.

If hemorrhage should occur during the course of acute bronchiectasis, then pneumothorax treatments should be helpful by decreasing the dilating forces while the walls of the bronchi are weakening due to the progressing acute infection, and would prevent further hemorrhage by compression. However, in chronic bronchiectasis little can be expected from collapse therapy.

In lung abscess pulmonary hemorrhage is one of the most common complications. Hemorrhage from abscess is usually not severe or even fatal except in chronic abscess where it is then due to the rupture of a branch of the pulmonary artery which traverses the abscess cavity. Where bleeding is not severe the treatment consists of rest, improvement in general health, and postural drainage. Collapse

XUM

therapy by artificial pneumothorax is advised by some and in some cases phrenicectomy, thoracotomy with drainage, and, last, lobectomy. Careful judgment is necessary to decide on the opportune moment for operation.

Pulmonary infarction with cough and bloody sputum follows within twenty-four to forty-eight hours after the lodging of an embolus in a large sub-division of the pulmonary artery. The condition may subside with general care or it may progress to abscess formation. Meyer and Nystram have devised a surgical technique for the treatment of pulmonary embolism.

In concluding, I wish to stress the importance of preventing the occurrence of pulmonary hemorrhage by prevention and early care and continued watchful care of the two most common disease conditions leading to this complication. We have all been taught the importance of the prevention and care of tuberculosis and are familiar with the fight against tuberculosis through clinics and sanatoria,—but little is taught about bronchiectasis being so common or so disabling and yet preventable in many instances. The importance of bronchiectasis as a disease condition lies not in the fact that it may lead eventually to hemorrhage, but because it so lowers the general health; it is the cause of chronic cough and expectoration, the sputum containing many infectious bacteria. It predisposes to pneumonia, abscess of the lung, and causes permanent injury to the parenchyma. That bronchiectasis follows infections early in life is a distinguishing feature. The condition is secondary to acute non-specific respiratory infections—colds, grippe, and sinusitis,—and follows the diseases of childhood and bronchial compression. The after-care as well as the care given during the illness is important in preventing and in arresting this disease. Hemorrhage may occur in the acute or chronic stage.

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DIAGNOSIS AND TREATMENT OF HEMORRHAGE FROM THE GASTRIC-INTESTINAL TRACT.*

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This part of the symposium will deal only with gross hemorrhage and not attempt to discuss minor bleeding, such as is demonstrated by microscopic or occult methods. We will discuss briefly hemorrhage caused by lesions in the stomach, the small intestines and the colon and rectum.

The general symptoms of internal hemorrhage are rapid weak pulse, dyspnoea, thirst, restlessness, fear, general weakness, pallor, and at times shock.

Microscopic evidences of gastro-intestinal gross bleeding are: *vomiting* of blood (hematemesis), found in lesions of the stomach, esophagus and duodenum; *tarry stools* (melena), found in lesions of the stomach and small intestines; or *visual* blood in the stools occurring in lesions of the ileum, colon and rectum. In cases of melena, the guiac or benzidine tests should be resorted to since certain drugs, such as iron, bismuth, charcoal and others, will alter the color of the stool and cause it to appear "tarry."

First let us consider bleeding from the stomach, and briefly discuss the etiology and diagnosis.

The most frequent causes of hematemesis may be classified as follows:

I. Intra-gastric causes such as peptic ulcer,

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erosion of the duodenum, cancer of the stomach, syphilis of the stomach, trauma, gastritis acute, post-operative hemorrhage.

A differentiation of these possibilities should be approached *first* by acquiring a full and complete history. Thus, *peptic ulcer* will give a history of upper abdominal pain relieved by alkalies and food, sensation of a lump in the throat or chest, heart burn, at times nausea after eating, etc. It must be remembered, however, that in cases of ulcer occurring in a silent area, hematemesis or melena may be the first symptom of the disease.

The symptoms of *erosions of the duodenum,* termed duodenitis, are about the same as those of peptic ulcer but not so severe in character and not relieved by alkalies and food as readily.

In *cancer* of the stomach, the diagnosis has usually been made before hemorrhage occurs, since gross bleeding is comparatively rare as compared with ulcer cases. However, the patient usually complains of increasing "indigestion," loss of weight, anorexia, nausea, "spitting-up" of food, but rarely has pain.

Lues.—Bleeding often is associated with syphilis of the stomach but, as in malignancy, gross hemorrhage is rare. The Mayo's report 5 per cent as having hematemesis. In cases suffering from digestive symptoms with melena or hematemesis, in which a history of syphilis is obtained, one should be suspicious of gastric lues or hepatitis due to syphilis.

Passive congestion of the gastric mucosa caused by cardiac insufficiency, portal obstruction, or diseases of the lungs, may cause gross bleeding from the stomach, and at times the sign may be caused by disease of the gall bladder or liver.

Once a satisfactory history has been recorded, we should utilize all laboratory means in order to arrive at a true diagnosis and cause of the bleeding. Peptic ulcer is most frequently associated with hyperacidity of the stomach. In cancer one will usually find evidences of secondary anemia and diminished gastric acidity or complete achylia, and a positive blood Wassermann is usually reported in the luetic cases, and in those subjects where passive congestion is at fault we are often able to determine evidences of cardio-vascular degeneration or hepatic insufficiency.

The X-ray is of inestimable value in the differential studies of gastric lesions but is as a rule advised against until hemorrhage has ceased and the patient is stronger.

II. Extra-gastric causes of gastric hemorrhage: Traumatic occurrences are noted as rare causes of hemorrhage. The swallowing of foreign bodies, the passage of a stomach tube through an already diseased esophagus, external blows over the esophagus or stomach, or stab and gunshot wounds, serve as the most frequent examples. When such a history is obtained, trauma must obviously be suspected as the cause. Also the effect of vomiting in cases of tabetic crisis has been reported to cause hematemesis in rare instances.

Other exogenous causes are cholecystitis, diseases of the esophagus, diseases of the spleen (Banti's diseases and splenic anemia, for example), diseases of the blood-making organs, such as true purpura, hemophilia, pernicious anemia, leukemia, and others; rupture of an aneurysm into the stomach, and cardiac and pulmonary diseases which have been mentioned previously.

Time will not permit of a discussion of the differential diagnosis of these rather unusual causes of hemorrhage from the stomach. Suffice it to say that the laboratory is of great aid in the studies of the blood picture; coagulation, the platelet count, color index, the Vandenberg test in cases of hepatic disease; X-ray when the gall bladder is suspected, etc., should be had. Of course, it is understood that a thorough physical examination should be made before laboratory findings can be properly recommended or interpreted.

Hemorrhage from lesions in the *small intestines,* other than the duodenum, which has been discussed under peptic ulcer:

Ulcerations caused by typhoid infection of the lymph nodes (Peyer's patches), in the lower ileum, not uncommonly result in gross bleeding. The symptoms of this condition are extreme restlessness, drop in temperature, sudden rise in pulse rate, and blood in the stools. The diagnosis is obviously not difficult when the intestinal excreta contains gross blood but may be truly suspected when the other symptoms and signs present themselves in a case of typhoid fever.

There are other pathological lesions of the jejunum and ileum which, while they rarely cause melena or bloody stools, should be mentioned here.

Hartman, in a study of 466 cases in which the histories and physical examinations indicated difficulty in the jejunum and ileum, found the followlowing pathological lesions, other than post-operative

XUM

gastro-jejunal ulceration (which might cause bleeding): carcinoma, 22; sarcoma, 9; polyps, 6; hemangioma, 3. All of these were proven either at operation or autopsy. These lesions exhibit symptoms of high partial or complete obstruction, with or without tarry stools or coffee ground vomitus, and usually a diminution in the blood chlorides. The location of the condition is determined by X-ray studies or by exploratory operation.

The *colon* and *rectum* are rather frequent seats of disease or conditions causing bleeding, which is usually noted in the fresh state (bloody stools).

Carcinoma is the most frequent pathological lesion and may occur in any portion of the large gut. The history is one of gradual increasing abdominal distress, with much gas and intermittent diarrhea and constipation, loss of weight, loss of strength, and bloody stools. If the disease is located in the lower sigmoid or rectum, the patient will often state that he is having "ribbon" stools. There is usually found a state of secondary anemia in the blood examinations. The diagnosis is concluded by roentgen examinations and, if located in the rectum, by proctoscopic study.

Intussusception should not be overlooked when bloody stools occur, particularly in children. The most common type usually involves both the small and large intestines. The terminal ileum is invaginated into the cecum and ascending colon. The common symptoms and signs are pain, vomiting, melena, excessive peristalsis (at times visible) and the palpation of a mass in the right abdomen. The condition has been known to occur in the colon alone but it is rare.

Gastro-intestinal hemorrhage is treated in much the same way as is gross bleeding from any other organ or group of organs. Shock should be combated or prevented at the onset. This may be accomplished by instituting absolute rest, the administration of morphia to relieve nervous tension and anxiety, and placing an ice-cap or ice-pack on the abdomen. The intravenous use of glucose and saline, or Ringer's solution, should be started, or acacia (gum arabic) may be given by veneclysis. Acacia is probably preferable in those severe cases which exhibit an extreme lowering of blood pressure. Blood volume should be maintained if possible.

Following the institution of these emergency methods, the case should be treated according to the cause or causes of bleeding.

In cases of bleeding from peptic ulcers, surgery is rarely if ever indicated, since the eroded areas heal rather rapidly and the patient returns to normal in a comparatively short time when treated by general medical means.

Surgery should obviously be resorted to in the traumatic group as soon as shock is relieved, except in the hemorrhage due to tabetic crisis. Also is surgical interference indicated in cases of intussusception and in some cases of cancer.

Most cases of splenic anemia will respond to splenectomy.

Pernicious anemia may be satisfactorily managed by diet, liver fraction and hydrochloric acid.

For the purpuric cases, liver fraction, calcium, the sun rays, removal of infections, diet and rest are usually all that is necessary in the treatment.

In bleeding from the small intestines, surgery is obviously indicated in those having obstructive symptoms or findings. Typhoid hemorrhages usually are checked by ordinary medical means.

In practically all cases transfusions are indicated and beneficial. The patient's condition improves more rapidly and the tendency to recurring hemorrhage is lessened.

Various coagulums, the use of whole blood given intramuscularly, and horse serum, have been advocated but in gross bleeding are probably of little use.

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HEMORRHAGE FROM THE URINARY TRACT.*

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Hemorrhage from the urinary tract is primarily managed as hemorrhage from other sources in the body. First, the patient should be treated for the shock. Second, when blood loss has been great, blood transfusion, saline and glucose should be given intravenously, external heat applied and opiates given for absolute rest.

Hemorrhage occurring from traumatic rupture of

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the kidney should be treated conservatively in the majority of cases. In the cases of severe hemorrhage, with rapid pulse, low hemoglobin and lowered blood pressure, the hemoglobin and blood pressure should be checked at frequent intervals, as it is the safest guide for surgical intervention, and when these symptoms persist or increase after shock treatments have been given, immediate surgical treatment should be started.

When surgery is indicated, suturing the rent and packing the wound should be done. When the hemorrhage is not controlled by this method, either from the fact that there is a tear in the large vessels or excessive damage to the parenchyma, renal pelvis or ureter, a nephrectomy should be done.

Hemorrhage occurring during a surgical procedure upon the kidney may be primary, as from damage to the vessels in mobilizing the kidney, or from aberrant vessels. In injuries of this type, bleeding should be controlled by ligating the bleeding vessel or, when the large vessels of the pedicle are found torn, immediate nephrectomy should be done. Injuries to the vena cava cause very severe hemorrhage.

In four cases reported by Priestly and Walters from the Mayo Clinic, success followed clamping the rent so as not to completely occlude the vessel, and leaving the clamps secured for one week, when clamps are released but not removed. After twenty-four hours, the blades are loosened and removed.

Other methods of controlling this type of hemorrhage are packing, partial ligations, and complete ligations below the renal vein.

Secondary hemorrhage occurring after operations may follow large nephrotomy openings into the kidney; from aberrant vessels unnoticed at operation, or slipping of a ligature about the pedicle after nephrectomy. This type of hemorrhage, when severe, calls for re-openings of the incision, removing the clots with great care and clamping and ligating when possible, or packing the wound tightly with gauze when impossible to ligate.

Tumors arising from the pelvis and parenchyma of the kidney produce bleeding in 80 per cent of reported cases, and severe hemorrhage has been reported in a fair percentage of these. The hemorrhage is controlled to some extent by deep X-ray radiation and, when the patient's condition permits, nephrectomy should be done.

Infection, acute and chronic, of the renal pelvis, particularly the granular type, causes considerable hemorrhage at times. It is usually controlled by large in-dwelling catheters and lavage of the pelvis with silver nitrate, 1 to 5 per cent.

HEMORRHAGE OCCURRING IN THE BLADDER AND URETHRA

Rupture of the bladder has produced marked hemorrhage within the peritoneal cavity and bladder. The treatment in this type hemorrhage is immediate opening of the peritoneum and bladder, ligating the bleeding vessel, closing the rent and draining both the peritoneum and bladder.

Hemorrhage from tumors of the bladder may be controlled in several ways. First, by electro-coagulation trans-urethrally. Second, by high voltage X-ray. Third, by supra-pubic incision and coagulation with high-frequency current, or excision of the tumor when accessible.

Hemorrhage from benign adenomatous prostatic obstruction occurs with great frequency and is controlled by first removing clots through a large cystoscope and electro-coagulation of bleeding points, and in-dwelling catheter. When unable to control by this method, supra-pubic cystotomy should be done, with coagulation of bleeding points, or packing may be necessary. Usually with sufficient drainage and hot bladder irrigations, this type of hemorrhage is readily stopped.

Hemorrhage following operations upon the prostate are rather frequent, both from open operations and trans-urethral operations. Methods of control of bleeding at the time of operation in supra-pubic prostatectomy are:

1. Clamping and ligating bleeding points.
2. Packing the space left after gland removal with gauze.
3. Use of hemostatic bags of the type used by Hagner and Pilcher.
4. Using large tubes for drainage.
5. Hot irrigations with potassium permanganate or 3 per cent sodium citrate.

After trans-urethral operation the hemorrhage is controlled completely in most cases during operation by coagulation of bleeding points and a large catheter for drainage, which is kept clean by frequent irrigation.

When bleeding of severe type occurs after operation, no time must be lost in re-introducing the resectoscope and emptying the bladder of all clots,

XUM

locating the bleeding point which is readily controlled in most instances by coagulation current. When bleeding is uncontrolled by this means the bladder should be opened supra-pubically and controlled as in open prostatectomy.

Severe hemorrhage from the urethra occurs mainly from trauma, as from instrumentation or rupture of urethra from fracture of the pelvis. This hemorrhage is usually controlled, first, by large indwelling catheter, and, second, by locating the bleeding point with cysto-urethroscope and coagulation with a high-frequency current.

When rupture of urethra is complete, a supra-pubic drainage and suture of the torn urethra about a large in-laying catheter, with adequate drainage will control the marked hemorrhage.

CASE REPORTS

To cite a few instances of severe bleeding, briefly:

Case 1.—A young man came into my office for relief of a chronic lower tract infection. I found a very minute meatus to the urethra and did a simple meatotomy. After completion of the examination a simple dressing was applied and the man allowed to return to his home. Late during the same night I was called to stop a severe bleeding which came from the meatus. The patient had some slight oozing and had applied a tourniquet in the form of small rubber bands, about twenty or thirty, placed fairly tight about the penis. A continuous stream of venous blood had kept up and the patient was white with fright and loss of blood. Removal of the bands, which had constricted only the venous return, a small cotton application in the meatus with a snug dressing, stopped the bleeding at once.

Since then, it has been my custom to take three small stitches after each meatotomy, which has controlled the bleeding.

Case 2.—Patient, white, male, age sixty. Had several dense strictures of the urethra which were dilated to 24 F., using La Forte sounds. There was a slight amount of blood to follow, but patient was able to void. Later in the day the patient was sent to me because of a rather profuse bleeding that had continued almost through the day. With some difficulty an 18 F. cysto-urethroscope was passed and the bleeding found in one of the scarred areas, and with a light coagulation current the bleeding stopped. A small in-dwelling catheter was placed into the bladder. This was removed the following day with no recurrence of the hemorrhage.

Case 3.—White, male, age sixty-eight. Had complained of difficulty in urinating for some time. Suddenly, on straining, he began to pass bloody urine and then had complete retention, for which he sought relief. Examination revealed a large, smooth, but firm prostate. An 18 F. catheter passed, but would drain very little except a few small clots and bloody urine. A cystoscope was then passed and, after much washing out of clots, the bladder was clear enough to see a large intravesical prostate with chronic cystitis. An in-dwelling catheter was left in the bladder and patient referred to hospital. Later, in the evening, the catheter was blocked again and the bladder became tense with blood and urine. Attempts to remove clots resisted all my efforts. When a supra-pubic cystotomy was done and a large amount of clotted blood removed, no bleeding was present on inspection of the bladder. A large drainage tube was placed in and the bladder closed. Patient drained well with no return of the bleeding. A second operation, consisting of removal of a large adenoma of the prostate, was done with no undue hemorrhage. Recovery uneventful.

Hemorrhage of this type is more common when found with carcinoma of the prostate, as carcinoma arises usually in the posterior lobe, while adenoma is close under the mucosa.

Case 4.—Patient, white, male, age seventy-four. Had supra-pubic prostatectomy about one year previously and had been voiding well since. Then began to have extreme frequency and terminal bleeding. Cystoscopy under sacral anesthesia revealed a growth about the size of a chestnut on the right side of bladder trigone. Biopsy showed carcinoma. High-voltage X-ray was begun with fulguration of the mass. Bleeding checked for a while, but within three months a severe hemorrhage occurred. A supra-pubic cystotomy was done at that time. The whole right half of the bladder wall was infiltrated with carcinoma. Patient died by end of the month. Metastases to liver and stomach were present. The prostate, when removed, was apparently a benign adenoma, and sections revealed no carcinoma.

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THE PROBLEM OF UTERINE HEMORRHAGE IN GYNECOLOGY.*

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It is fitting in this symposium on hemorrhage that uterine bleeding be given important consideration. Adequate discussion of the subject would require a lengthy gynecological treatise and recourse to various sources. The discussion, however, will be rather sketchy and based entirely on personal experience. The obstetrical side of the problem will be entirely omitted although abortion probably accounts for 50 per cent of all cases of uterine bleeding.

CAUSE

Excluding obstetrical bleeding, the causes of uterine hemorrhage may be divided into two large groups, one organic and the other funtional. The principal organic causes are as follows:

Uterine fibromyomata
Adnexitis
Ovarian cyst
Cervical and uterine polyps
Cancer of the cervix
Cancer and sarcoma of the uterus
Uterine retrodisplacement
Endometriosis
Erosion and endocervicitis
Sloughing or subinvolution subsequent to cautery or surgical diathermy of the cervix
Fibroid uterus
Chronic endometritis
Hyperplasia of the endometrium
Pelvic tuberculosis
Tuberculosis of the cervix
Syphilis
Purpura hemorrhagica
Hypertension.

This is a long and imposing list of organic causes of pathological bleeding. In the average practice, they still account for only 50 per cent of the cases, the remaining 50 per cent having to be classified as functional. This is because of the great frequency of menorrhagia at the two extremes of menstrual life, puberty and menopause.

DIAGNOSIS

While no absolute diagnosis can be made from it, the history in uterine hemorrhage is of value in ruling out uterine or tubal pregnancy and certain inferences can be made from it as to the probable cause of the bleeding. Menorrhagia is usually indicative of less pronounced pathology than metrorrhagia, or irregular bleeding between periods. Pelvic pain associated with the bleeding is significant of more serious trouble than bleeding alone. Menorrhagia before the age of twenty is less significant than menorrhagia at the menopause, when malignancy must always be kept in mind.

A few causes of uterine bleeding often have a fairly typical history. Thus, with submucous fibromyomata there is a lengthening of the bleeding time and an increased amount of flow, i. e., menorrhagia. The bleeding of a cervical polyp or of cancer of the cervix is usually slight at first, an irregular spotting or metrorrhagia often brought on by exertion, the trauma of a douche nozzle or coitus. Endometriosis often produces an acquired dysmenorrhea. Uterine malignancy typically occurs after the menopause and the passage of tissue shreds often accompanies the irregular bleeding.

An entirely negative speculum and bimanual examination of the cervix, uterus, adnexa and cul-de-sac suggests funtional uterine bleeding as the diagnosis. Certain reservations must, however, be made relative to this statement. The uterus whose wall has become thickened and heavy, the so-called fibroid uterus, may feel relatively normal on bimanual examination. A submucous fibroid may cause extreme hemorrhage and yet escape the hand and even the exploring curette. Likewise, a uterine polyp and uterine malignancy may in no way be detectable except upon dilatation and curettage. Simple hypertrophy of the endometrium and the rarer chronic endometritis may at times be diagnosable as an office procedure by endometrial biopsy, with the aid of the suction canula after the method of Burch or Novak. Occasionally uterine hemorrhage is a manifestation of syphilis or even more rarely of purpura hemorrhagica. A normal coagulation and bleeding time, normal retraction of the clot and normal platelet count will rule out the latter.

When the bimanual examination discloses pelvic

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XUM

pathology to explain the bleeding, pitfalls in the differential diagnosis are common. The greatest difficulty lies in differentiating pelvic inflammatory disease, ectopic pregnancy, and painful cystic ovary. On the functional side, it should be borne in mind that a single follicular cyst is not uncommon in functional bleeding and that such an ovary may be quite tender. Under these circumstances a history of amenorrhea and subsequent continuous bleeding presents a clinical picture which closely simulates tubal pregnancy. Atypical uterine bleeding, large tender masses in the fornices and bilateral lower abdominal tenderness invaribly lead to the diagnosis of pelvic inflammatory disease and ectopic pregnancy is frequently disclosed on the operating table.

Before passing to the second and third stage in the diagnosis of uterine bleeding, therapeutic trial of anterior pituitary luteinizing hormone and the diagnostic curettage, I should like to call attention to an entity I have never seen described in the literature, trichomona vaginalis, as a cause of uterine bleeding. I have seen five such cases. The history and the type of bleeding are fairly characteristic. The period starts on time but grumous bloody discharge has persisted ever since. Infected abortion is suggested by the offensive odor and evident admixture of pus and blood. The warm well-diluted hanging drop preparation of the discharge has in each instance disclosed many active trichomonads and appropriate treatment has cured the bleeding and the leucorrhea.

In the presence of a normal pelvic examination and with due consideration of factors heretofore discussed, one is often justified in beginning to treat the patient for functional uterine bleeding before employing more radical methods of diagnosis. This is particularly true in menorrhagia before the age of twenty. The use of the anterior pituitary luteinizing hormone as a therapeutic trial thus may often become the second stage in the diagnosis at this age. As age increases, the third procedure in the diagnosis of uterine hemorrhage, uterine curettage, becomes more and more urgently indicated. Curettage is, however, not always an infallible instrument in the diagnosis of uterine bleeding. A submucous fibroid may entirely escape attention and be disclosed only on laparotomy and bisection of the uterus. Malignancy of the fundus may occasionally be missed. Instead of much hyperplastic tissue almost no scrapings at all may result even in the presence of definite follicle cystosis and other evidence of true functional uterine bleeding. A chorioepithelioma may escape the curette and be diagnosed only by quantitative hormone tests. If much pelvic pain has existed with the bleeding, the negative curettage findings should almost invariably be followed by the fourth step in the diagnosis of uterine hemorrhage, laparotomy. With surprising frequency the wisdom of the procedure will be proven when the abdomen is opened.

It is seen that in the presence of a normal speculum and bimanual examination one is often led to the diagnosis of functional uterine bleeding either before or after curettement. To this diagnosis by exclusion may be added certain confirmative data. Age *per se* is important. The nearer the patient is to the two extremes of menstrual life, the more likely is the bleeding to be functional. Stigmata of endocrine imbalance may exist in the young patients of the first group. While not quite so characteristic, the truly functional bleeding of the menopause is still somewhat typical. Usually one to several periods are skipped and then there occurs a long and profuse menorrhagia. Lowered thyroid function and pituitary dystrophy may exist in both groups, and in this connection the specific dynamic action of protein as emphasized by Goldzieher should be mentioned. This is the total increase in heat production above the normal of an individual after the ingestion of a protein meal. If the whites of three eggs, a slice of toast, and a cup of tea without sugar are taken after a control basal metabolism test, there is an increase of about 16 per cent in the B.M.R. two or three hours later in a normal individual. In pituitary deficiency the average increase is only 3 or 4 per cent.

The diagnosis and the treatment of uterine hemorrhage frequently go hand in hand. The vaginal examination may readily classify the case and permit of a simple treatment to stop the flow. Curettage or curettage and radium may satisfy the requirement of diagnosis and effect a cure; the use of the luteinizing hormone of the anterior pituitary gland may both arrest the bleeding and disclose its functional nature. In many cases the fourth major step for diagnosis becomes necessary, laparotomy. Each case must be decided on its merits, but, in general, acquired dysmenorrhea or pelvic pain with

the bleeding, palpable adnexal pathology, a uterus larger than a three-months' pregnancy, therapeutic failure of the luteinizing hormone of the anterior pituitary call for abdominal section for diagnosis.

TREATMENT

The treatment of uterine bleeding of organic cause is always the removal of the existing pathology and only a few generalities about this type will be made.

Uterine hemorrhage caused by fibromyomata may be treated by irradiation, hysterectomy, myomectomy or defundation. Irradiation is best reserved for intramural tumors not larger than a three months pregnancy, and not causing pressure symptoms and not degenerating. Irradiation should not be employed in the presence of adnexal pathology or where the possibility of pelvic adhesions exists as suggested by previous operation. The highly nervous patient and patients under forty years of age are usually better off with a supra-vaginal hysterectomy or defundation with preservation of ovarian function than with precipitous and permanent menopause.

Uterine hemorrhage due to adnexitis is treated by attention to the causative pelvic inflammatory disease. However, when the case comes to operation, in addition to removing the adnexal pathology, a defundation should likewise be performed should an ovary in whole or part be left. Otherwise, the usual failure of the residual ovary to form corpora lutea will often produce subsequent menorrhagia. Likewise, the fundus of the uterus should usually be removed as a part of the suspension when operating for bleeding associated with retroversion. Space does not permit observations on the treatment of ovarian cyst, cervical polyp, cancer of the cervix, cancer of the uterus, endometriosis.

The bleeding of hyperplasia of the endometrium, chronic endometritis and fibrous uterus often ceases with simple curettement. Failure may require supplemental irradiation or abdominal surgery. Hyperplasia of the endometrium and functional uterine bleeding are often synonymous and their treatment will be further elaborated on under the latter head.

There remains to be discussed the treatment of the largest single cause of uterine bleeding, exclusive of cases related to pregnancy—functional uterine bleeding. The variety of medications and procedures mentioned for the treatment of this presumably endocrine disturbance suggests the difficulties that may be experienced in its cure. The therapeutic list includes: parahormone, stypticin, ergot, mammary-pituitary gland combinations, anterior pituitary luteinizing principle, placental extract, moccasin snake venom, insulin, iron, thyroid, blood transfusion, rest in bed, curettage, low voltage irradiation of the ovaries and pituitary gland, uterine application of radium, supra-vaginal hysterectomy. Space permits only a brief description of these various treatments.

Anterior pituitary luteinizing substance: Follutein and antuitrin S, obtained from pregnancy urine, well represent this form of therapy. Cures range from 25 to 75 per cent of functional cases. My own series is too small to report but I am sure of the value of these preparations. One hundred to two hundred rat units should be given daily until the bleeding stops. The same dosage should be given every other day until the next period is safely passed. If benefit has been obtained, it is well to continue to give several injections before each menses for several more months. If benefit is not being obtained, it is well to try one or two cubic centimeters of plain antuitrin along with each dose of the luteinizing substance. This is based on a known synergism between these two hormones. The use of the therapy under discussion is irrational in menopausal menorrhagia. In such cases there already exists an increased pituitary secretion secondary to atrophy of the ovaries. Then, too, the fear of malignancy indicates more radical treatment.

Mocassin Snake Venom: Peck and Rosenthal in the *Journal of the American Medical Association* for March, 1935, reported their experience with the use of moccasin snake venom in hemorrhagic conditions. Experimenting with the Shwartzman phenomenon, these authors observed that when a previous injection of snake venom was made the animals became refractory. The local hemorrhagic necrosis characteristic of this phenomenon was either delayed or entirely prevented. Purpura hemorrhagica, epistaxis and other types of bleeding respond with varying success to the snake venom treatment, but the best results were obtained in functional uterine bleeding. In three articles to date, the authors have reported twenty-four cases, all improved. I have used the method in four cases, three with success. An available commercial preparation for this form of therapy is "snake venom solution moccasin," Lederle. It is a 1:3000 solution of the venom in

XUM

physiologic saline. For the initial dose 0.4 c.c. is given, and for each successive treatment this dose is increased by 0.1 c.c. until 0.8 c.c. to 1 c.c. is being given. Treatment is continued twice weekly for two or three months and then the interval between injections gradually increased for another month or so. A local reaction due to sensitization often occurs after the fourth or fifth injection, requiring reduction in dosage and de-sensitization.

Insulin: It has been observed that frequently the menstrual periods are delayed in patients receiving insulin. This knowledge led to its use in functional uterine bleeding, and sufficient cases have been reported to warrant its continued trial. The method is of special value in the young under-nourished girl, and is used in conjunction with an upbuilding program. Five to ten units are used before the two main meals beginning a few days before the expected period. Polymenorrhea or too frequent menstruation has also responded to insulin therapy.

Thyroid and Iron: Many patients with menorrhagia are anemic and have a lowered metabolic rate. Adequate medical treatment of these conditions will often affect favorably the bleeding. This is particularly true of functional uterine bleeding of adolescence and girlhood. In fact, small doses of thyroid, large doses of iron, rest in bed at period time, anterior pituitary luteinizing hormone and the new moccasin snake venom are the mainstays of therapy at this age.

Blood Transfusion: This plays an important part in the treatment of all forms of uterine hemorrhage. All too often the patient is "in extremis" when first seen and vaginal packing to stop the flow and transfusion to replace blood loss become urgent. Repeated transfusions are often necessary before any surgery can be performed on these patients. In the presence of severe anemia even irradiation must be postponed until at least one transfusion has been given. Often it is wisdom to transfuse, then use radium for temporary control of the bleeding and subsequently perform a hysterectomy when the patient is rehabilitated.

Curettage of the Uterus: The frequency of curettage as a treatment for functional uterine bleeding has diminished in proportion to the development of newer methods. Curettement, however, may still be all that is required to straighten out an otherwise obstinate case. In the young, when simpler forms of treatment have failed, the benefit of one and occasionally of repeated curettements should be tried before employing more radical procedures. It is well to explain to such patients the frequency with which the natural re-adjustment of the menstrual function occurs and the need for conservatism so long as safe.

Curettage and Radium: This is the method of choice in severe cases not responding to medical treatment or curettement alone. The method is best reserved for the mature woman or patient at or beyond the menopause. Here, again, it is important not to be too radical. In the regularly menstruating woman it is highly important not to bring on the menopause or even to produce marked symptoms of hypo-ovarianism. The radium dosage in each case must be decided individually, but the following is recommended by Keene: Under twenty years of age use it but rarely and never over 200 milligram hours; from twenty to thirty years of age 300 to 400 milligram hours; from thirty to forty, 300 milligram hours; at forty years of age, 400 to 500 milligram hours; from forty to fifty years of age, 800 to 1200 milligram hours. Between the ages of twenty and thirty the ovaries are relatively resistant and often the 400 milligram hours dosage is safe; between the ages of thirty and forty there is increased susceptibility to radium, so that the 300 milligram dosage should be tried first. If this fails, subsequent irradiation with 400 milligram hours should be employed. Six hundred and eight hundred milligram hours dosage at this age is apt to produce profound menopausal symptoms.

Low Voltage X-Ray of Ovaries and Pituitary: In skilful hands this form of therapy is an alternative for radium. The dosage is harder to control than radium, making its use undesirable in the young, and at the menopause a diagnostic curettement is usually necessary, so the combination of curettage and radium is preferable.

Supra-Vaginal Hysterectomy: This is, of course, a certain cure to be used in place of the simpler methods discussed above, or upon their failure. Many patients are better off with the uterus out and the ovaries in than with a precipitous menopause as the result of radium. Often a defundation can be performed, adequately controlling the bleeding and leaving the patient a small monthly period. As indicated in the discussion of radium therapy, hysterectomy is preferable to large dosages of radium

XUM

between the ages of thirty and forty, because of the severity of the menopausal symptoms at this time.

SUMMARY

Uterine hemorrhage is organic or functional. A careful speculum and bimanual examination will classify most cases. If the cause is not visible or palpable, one usually has to consider pregnancy, hyperplasia, uterine polyps, submucous myoma, uterine malignancy, syphilis, blood dyscrasia, and functional uterine bleeding. Pitfalls in the differential diagnosis are many. Treatment of the organic group consists of removal of the pathology present. Treatment of the functional group varies from simple medical management to radical surgery. Each case is a problem in itself, but "patience" is the keynote in adolescence, "conservatism" with preservation of the ovarian function the watchword in the regularly menstruating adult, and "action" with malignancy in mind the guide at the menopause.

Medical Arts Building.

GONADOTROPIC FACTORS AND SEX HORMONES.*

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In a short lecture one cannot attempt to give a complete review of a major problem. Thus I can present only a selection from what appears to be the most important evidence. The hypophysis cerebri has been said to be the central gland of internal secretion. Certainly all the glands of the body depend to some extent on the function of the hypophysis. Among the hormones of the anterior lobe, the gonadotropic factor plays an important rôle in bodily economy. The production of such a hormone by the pituitary was definitely proved by B. Zondek and S. Aschheim in 1926. By implantation of a minute particle of anterior lobe tissue from man or animals into the upper part of the thigh of infantile female animals (preferably mice), they were able to initiate precocious ovarian function. It is to be emphasized that the outcome of these experiments was the same with hypophyseal tissue obtained either from male or female individuals. The gonadotropic factor is therefore nonspecific as far as sex is concerned. Independently, P. E. Smith in this country was able to obtain results similar to those of Zondek and Aschheim.

Under the influence of the gonadotropic factor obtained from the hypophysis, maturation of the sex glands of either male or female individuals takes place. The so-called Aschheim-Zondek reaction is now generally known. Complete maturation of the ovaries in rodents under the influence of gonadotropic hormones becomes apparent by three characteristic changes or stages:

1. Maturation of the previously immature follicles.

2. Formation of so-called "blood points" (Blutpunkte), or minute hemorrhages in the mature follicles.

3. Formation of real corpora lutea within the cavity of the former follicles.

These three characteristic stages are called Anterior Pituitary Reaction (A.P.R.), I, II, and III.

After the follicles have become mature or when at least A.P.R. I is observed, regular estrous cycles are initiated. Such cycles run parallel with changes in the mucous membrane of the vagina: when the cornified upper layer is discharged into the vaginal lumen, the microscopic picture of the smears shows characteristic squamous cells, and during this phase the animal is in estrus. It is characteristic that cohabitation takes place during this estrous phase, after which the squamous cells form with the sperm a solid mass which closes the vagina, and thus superfecundation is normally impossible. The estrous cycle is now known to be brought about through the activity of the follicular hormone, which is produced in the Graafian follicles.

The gonadotropic factor of the anterior pituitary is able to stimulate maturation of the Graafian follicles, and formation of corpora lutea. Zondek and Aschheim proved that a hormone, showing to a

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XUM

certain degree the physiological properties of the anterior pituitary gonadotropic substance, is regularly present in the urine of pregnant women. Apparently, pregnancy results in an over-production of this hormone, and the excess is eliminated by way of the renal mechanism. This substance—designated "Prolan"— appears to be present only in pregnancy urine of man and monkeys. Zondek and Aschheim are of the opinion that two different substances, Prolan A and B, are responsible for the Zondek-Aschheim reaction. According to their (also Hisaw's) opinion, Prolan A causes A.P.R. I, or maturation of the follicles, and Prolan B brings about luteinization of the mature follicles. It should be said, however, that several authors are of the opinion that there is no chemical proof of the existence of two distinct substances; e. g., the effects may perhaps be a question of dosage—small doses may cause only reaction I, larger ones also reactions II and III. The Aschheim-Zondek reaction is reliable in about 98 per cent of cases, and allows a diagnosis of pregnancy to be made within a few days after conception.

The urine of pregnant women is not the only source from which one can obtain preparations which resemble—as far as the physiological effect is concerned—the gonadotropic factor of the anterior pituitary. Castrated women and also women in the menopause eliminate such substances in the urine; moreover, the placenta has been shown to contain gonadotropic hormones (Collip).

All the gonadotropic substances which have been mentioned stimulate development of the sex glands in both males and females. Gonadotropic preparations may therefore be used clinically in the case of hypofunction of these organs (especially developmental disturbances). All the commercial preparations are obtained from pregnancy urine, and there appears to be no reliable preparation on sale which is obtained from the anterior pituitary. Their physiological effect is rather similar to that of the anterior pituitary and they have thus been designated anterior-pituitary-like substances. No proof of the chemical identity of these substances has yet been obtained; the evidence indicates that they are related to the proteins, the identification of which is rather difficult. The following are the best known preparations of this kind:

1. ANTOPHYSIN. Manufacturer: Winthrop Chemical Company, New York. Dry stable powder in ampules. The same preparation is on sale in Germany under the designation "Prolan." The method of preparation was worked out by Zondek.

2. FOLLUTEIN. Manufacturer: E. R. Squibb & Sons, New York. Sterile glycerine solution. The method of preparation differs only slightly from the procedure described by Zondek.

3. ANTUITRIN S. Manufacturer: Parke, Davis & Co., Detroit, Mich. Sterile aqueous solution. The method of preparation differs only slightly from the procedure described by Zondek.

The specific sex hormones are formed within the sex glands themselves. In the ovary two different types of hormones are produced, the so-called follicular hormone and the corpus luteum hormone. In human beings usually only one follicle matures at a time. At the height of maturation the follicle ruptures and ovulation takes place. The mature ovum, which was previously imbedded in the follicle, leaves the latter and passes through the tubule into the uterus. After ovulation has occurred, the follicle undergoes a characteristic change—a yellow mass grows in its cavity, the so-called corpus luteum. If fertilization of the ovum does not occur, the corpus luteum gradually undergoes degeneration. If pregnancy occurs, the corpus luteum is maintained throughout pregnancy. The presence of the corpus luteum is essential for the maintenance of pregnancy. Habitual abortion may be due to dysfunction of the corpus luteum.

Investigations have shown that the developing follicle contains a certain hormone—the follicular hormone; it is also present in the corpus luteum. A second, physiologically different hormone is the corpus luteum hormone; it is found only in the corpus luteum.

The changes which occur in the ovaries of mature women are closely connected with those which take place in the uterine endometrium. Through the influence of the follicular hormone, produced in the maturing follicle, the uterine endometrium undergoes a characteristic growth; furthermore certain glands develop in the endometrium. This is called the proliferation phase which lasts until about the fourteenth day of the menstrual cycle. At that time the mature follicle ruptures—thus ovulation takes place. In the cavity of the ruptured follicle the corpus luteum is developed. Two hormones—the follicular

and the corpus luteum hormone—are now liberated and become effective in the organism. Under the influence of the corpus luteum hormone the uterine endometrium commences to function very actively: its glands begin to secrete (secretion phase), and the endometrium is properly prepared for imbedding the ovum. If fertilization of the ovum does not occur, the uterus casts off the secreting endometrium, and hemorrhage (menstruation) takes place. Simultaneously, an abrupt decrease of the follicular hormone content of the blood is observed. Following menstruation, the whole cycle is started once more.

In man and the anthropoids the transition from the phase of proliferation to that of secretion takes place in a continuous process, while in other animals the transition is more abrupt. In rodents only the phase of proliferation usually occurs; at its height ovulation takes place along with the estrous phase of development of the mucous membrane of the vagina. If cohabitation does not occur, the proliferated endometrium degenerates and the cycle starts anew. If cohabitation does take place while the animal is in estrus, however, the phase of secretion develops in the uterus and thus provision is made for implantation of the fertilized ovum. The estrous cycle in rodents is therefore not wholly similar to the menstrual cycle in man. In this connection it may be mentioned that B. Zondek[1] recently stated that "in the human vaginal mucosa no cyclic changes could be found which are analogous to those of the uterine mucosa."

Following removal of the ovaries and also during the period of menopause, as is well known, no menstrual cycles are observed. In both cases the two stimulating factors, the follicular and the corpus luteum hormone, are lacking. Recently Kaufmann[2] succeeded in restoring in such individuals regular menstrual cycles. The patients were first treated for about three weeks with follicular hormone, in order to transform the degenerated endometrium of the uterus into the phase of proliferation. After this treatment the corpus luteum hormone was administered for about one week. There resulted a normal menstrual type of uterine bleeding, and particles of the endometrium found in the blood were typical of the phase of secretion.

The Allen-Doisy vaginal smear test for assaying follicular hormone on castrated rats (or mice) is well known. The administration of the hormone brings these animals to estrus within a short time. Thus the follicular hormone may also be called an estrogenic hormone. Roughly speaking, one rat unit is the minimum amount of follicular hormone which causes estrus in a castrated rat.

The progestational hormone of the corpus luteum can be assayed in two different ways. The test method which is used preferably in this country was worked out by Corner and W. M. Allen.[3] The hormone is administered for five days to an adult rabbit which has been mated and afterwards castrated. Without any treatment pregnancy cannot be maintained since the corpus luteum hormone is lacking. An American rabbit unit (Corner and Allen) is the minimum quantity of hormone which, divided into five equal doses, produces on the sixth day a state of the uterus equal to that of the eighth day of a normal pregnancy. A number of workers in Germany use the Clauberg[3] unit or European rabbit unit which is measured in a similar way: immature rabbits of 600 gm. weight are used. They are first primed with ten doses of estrogenic substance preceding the five days' course of treatment with the corpus luteum hormone.

The function of the ovary and the production of its two hormones are regulated by the anterior lobe of the pituitary gland. On the other hand, the functions of the uterus and the vagina are dependent on the functions of the ovaries. Also the development of the so-called female secondary sex characteristics, such as mammary glands, pubic hair, and many others, is dependent on the hormones of the ovary, especially the follicular hormone.

Recently it was found that there exists an equilibrium between the production of the gonadotropic and other factors of the anterior pituitary and the production of the follicular hormone in the ovary. As soon as too much follicular hormone is produced, the excess exerts an inhibiting effect on the anterior pituitary. Thus an injection of large doses of follicular hormone into animals always resulted in a decrease of the gonadotropic hormone in the pituitary gland. Zondek[4] found that the "administration of follicular hormone over a long period inhibits the anterior lobe of the pituitary so that the growth hormone and the gonadotropic hormone are not active. Dwarfed animals with hypoplastic genitals result. Ovaries and testes undergo complete atrophy." A decreasing amount of follicular hormone in the

XUM

organism, such as during menopause or in the case of castration, brings about the opposite effect. Over-production of the gonadotropic factor may become so great that excretion occurs by the way of the urine. Sometimes the over-production of other pituitary hormones, such as the growth hormone, is likewise stimulated by castration or during menopause, and thus cases of acromegaly have occurred.

There are many indications for therapeutic usage of the two female sex hormones. The follicular hormone has been employed successfully to give relief during the period of menopause and in cases of castration, amenorrhea, dysmenorrhea, and migraine. Recently it was also successfully used in the case of gonorrheal vaginitis in children. The administration of the corpus luteum hormone is indicated especially in the case of habitual abortion. Miscarriage may now be avoided in many cases by systematic treatment with the progestational hormone of the corpus luteum during pregnancy. Furthermore, it may be used in cases of metrorrhagia and menorrhagia. In this connection it was recently shown that the oxytocic factor of the posterior pituitary (acting on the uterus) and the pure corpus luteum hormone (progesterone) are antagonists.[5]

Regarding the sex organs of the male, the interstitial cells of the testes are very probably analogous to the Graafian follicles; thus they contain the male sex hormone which regulates the secondary sex characteristics. The development of the interstitial cells and their pertinent hormone is apparently regulated by the gonadotropic hormone of the anterior pituitary. There probably also exists an equilibrium similar to that which has been referred to in connection with the follicular hormone.

Two methods for assaying the male sex hormone are widely used. One is the well-known comb-growth test, which was devised by Gallagher and Koch. In capons (Leghorns), degeneration of the comb is uniformly observed, and the administration of male sex hormones brings about a restoration of growth to normal. One "capon unit" designates the dose which, injected once a day on two successive days, produces by the fourth or fifth day (average of three animals) a maximum growth of 20 per cent of the surface of the comb. The male sex hormone exerts a specific growth effect on the male sex apparatus, especially the epididymis and the seminal vesicles. Stimulation of development of the infantile seminal vesicles in young rats into the adult type can be used as a test for male sex hormones. One "seminal vesicle unit" is the dose which must be injected into infantile male rats once daily for eight successive days in order to transform the undeveloped epithelium of the infantile seminal vesicles into the epithelium of mature animals. Microscopic examination is necessary to reveal the effect.[6]

Relatively little is known concerning the chemistry of the gonadotropic substances isolated from the anterior pituitary and from urine. These substances are probably rather impure mixtures of peptone-like bodies and thus related to the proteins. Fortunately a great deal has been discovered regarding the chemistry of the hormones of the sex glands. All the results in this field, it may be said, have been obtained during the past few years. It is not possible to mention by name all the investigators who have worked on this subject. Most of the evidence was procured by A. Butenandt and his collaborators. Chemical investigations of the specific sex hormones have shown that a certain physiological action is not always performed by a sole chemical substance. Apparently Nature often uses several chemically closely-related substances for the performance of the same physiological task.[7] Thus we know at least three and there are possibly four chemically different substances which produce estrus. On the other hand, three* different substances have been isolated which produce either growth of the comb in capons or development of the seminal vesicles in infantile rats. It may be mentioned, however, that up to the present time only one chemical individual of the corpus luteum hormone has been isolated.

Table No. I contains a list of the male and female sex hormones. It shows that the estrogenic hormones may be obtained from several sources, and it is very interesting in this connection that they can also be found in plants.

Cholesterol must probably be regarded as the

*A fourth male sex hormone ("adrenosterone") is possibly present in the adrenal glands. T. Reichstein (*Helvetica Chimica Acta 19*, 223 [1936]) obtained from 1000 kilos of beef adrenals 26 mg. of impure crystals which were able to bring about growth of the comb in capons. The possible chemical formula is given as $C_{18}H_{24}O_3$. The comb growth effect is only one-fifth of that of androsterone.

mother substance of the sex hormones. It is a well-known fact that the bile acids are formed by oxidation of the sterols, and by this means the side-chain of the molecule is shortened. If shortening is carried still farther, the corpus luteum hormone is obtained. This is a di-ketone, and its chemical name is now given as progesterone. Again by oxidation one may split off the entire side-chain to yield the dehydro-androsterone. This substance is partly a ketone, partly a secondary alcohol. It differs from the androsterone in two respects: it contains two hydrogen atoms less (thus there exists a double bond), and also the spatial arrangement on one carbon atom (X) is different.

The dehydro-androsterone may be transformed either into the two other male sex hormones, androsterone or testosterone, or into one of the four estrogenic hormones. According to the investigations of Butenandt, it is very probable that the so-called androstenedion is an important intermediary product.[9] This substance has not yet been obtained from natural material; Butenandt prepared it artificially and obtained the very interesting result that it shows either estrogenic properties or the properties of a male sex hormone. One is justified, therefore, in making the assumption that this substance is transformed within the body either into an estrogenic hormone or into a male sex hormone.

It is to be observed that the estrogenic hormones contain at least three double bonds, thus forming a benzene ring structure within the molecule. Such substances can be formed from the androstenedion by means of a simple dehydrogenation and splitting off CH_4. It is easily possible that such chemical reactions are performed in the body tissues. Moreover there are indications that even male hormones, such as testosterone, can be transformed into estrogenic substances. The occurrence of estrogenic substances in male urine as well as in the testes is very interesting in this respect.

Regarding the effects of the male sex hormones

TABLE NO. I

GROUP	NAME	FORMULA	ISOLATED		PARTIALLY SYNTHESIZED BY
			FORM	BY	
I. Male Sex Hormones	Androsterone	$C_{19}H_{30}O_2$	Urine of Men	Butenandt, 1931	Ruzicka, 1934 (from Cholesterol)
	Dehydro—Androsterone	$C_{19}H_{28}O_2$	Urine of Men	Butenandt, 1934	Butenandt, 1935 Ruzicka, 1935 (both from Cholesterol)
	Testosterone	$C_{19}H_{28}O_2$	Bull testes	Laqueur, 1935	Butenandt, 1935 Ruzicka, 1935 (both from Cholesterol)
II. Female Sex Hormones a. Estrogenic Hormones	Estrone or α-Follicular Hormone (Theelin)	$C_{18}H_{22}O_2$	Urine of pregnant women or Mares Bull testes Palm, seeds	E. A. Doisy, 1929 Butenandt, 1929 Laqueur, 1931 B. Zondek Butenandt, 1932	Not yet
	Estriol or Hydrate of the Follicular Hormone (Theelol)	$C_{18}H_{24}O_3$	Urine of pregnant women Placenta Catkins of willows	Marrian, 1930 Collip, 1931 Skarzynski, 1933	Not yet
	Estradiol (Dihydro—follicular H.)	$C_{18}H_{24}O_2$	Graafian follicles	E. A. Doisy, 1935?	Not yet
	Equilenin	$C_{18}H_{18}O_2$	Pregnant mare's urine	Girard, 1932	Not yet
b. Corpus Luteum Hormone or Pregnancy Hormone	Progesterone, Luteosterone	$C_{21}H_{30}O_2$	Corpora lutea of the ovaries of pigs	Butenandt, Slotta, Hartmann, Allen and Wintersteiner, 1934	Butenandt, 1934 (from Stigmasterol) Fernholz, 1934

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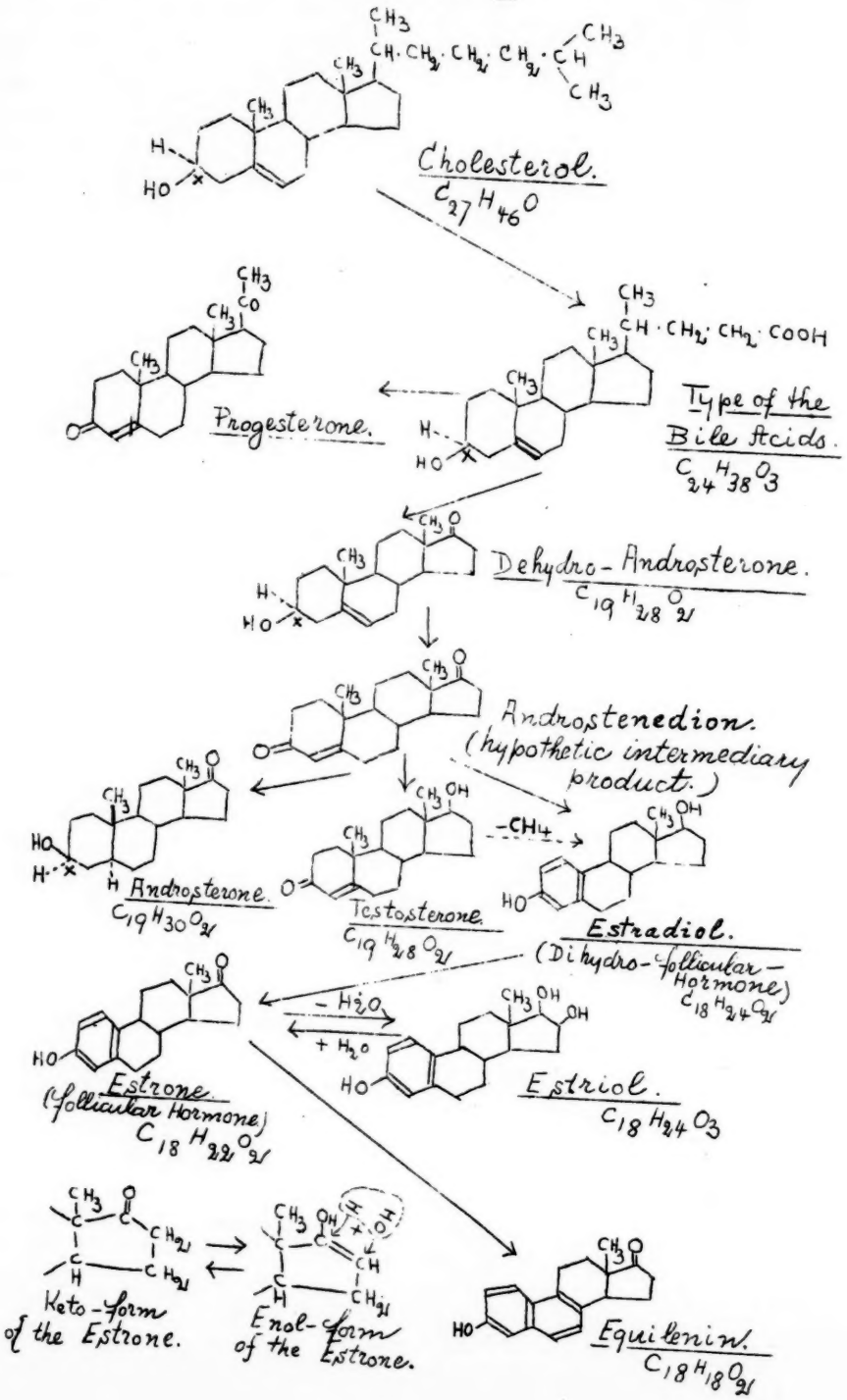
Table № II.


Cholesterol.
$C_{27}H_{46}O$
Progesterone.
Type of the Bile Acids.
$C_{24}H_{38}O_3$
Dehydro-Androsterone.
$C_{19}H_{28}O_2$
Androstenedion.
(hypothetic intermediary product.)
Androsterone.
$C_{19}H_{30}O_2$
Testosterone.
$C_{19}H_{28}O_2$
$-CH_4$
Estradiol.
(Dihydro-follicular-Hormone)
$C_{18}H_{24}O_2$
$-H_2O$
$+H_2O$
Estrone
(follicular Hormone)
$C_{18}H_{22}O_2$
Estriol.
$C_{18}H_{24}O_3$
Keto-form of the Estrone.
Enol-form of the Estrone.
Equilenin.
$C_{18}H_{18}O_2$

it should be mentioned that there exists no constant ratio between comb-growth units and seminal vesicle units. Thus, androsterone* shows a remarkable comb-growth effect and relatively little effect on the growth of the seminal vesicles. In the case of testosterone there exists not only a remarkable comb-growth effect, but also a strong influence on the growth of the seminal vesicles. Accordingly, androsterone and testosterone likewise influence the secondary sex characteristics such as growth of the comb. Therefore they can be likened to the effect of estrone on female individuals. Testosterone stimulates primarily the functions of the prostate gland and the seminal vesicle; it brings about, so to speak, a phase of secretion in males, the physiological consequence of which might be that state which is called sexual potency. Testosterone may be likened to progesterone which brings about the phase of secretion in the uterus. If one compares on the one hand the chemical formulas of androsterone and estrone, and on the other those of testosterone and progesterone, one will likewise notice a great similarity.[10]

Table No. III indicates the effectiveness of the different sex hormones: relatively small doses of chemically pure substances are observed to bring about remarkable physiological effect. It is worth while to mention that especially in the case of the estrogenic hormones, the effect is very much dependent on the manner of administration. These substances are quickly, apparently in some cases too quickly, absorbed. Since estrone contains a phenolic OH-group, it can easily form an ester with benzoic acid. If only one injection is performed, the benzoic acid ester proves to be more effective than the free hormone, and positive estrus is observed for a series of days.[11] The reason for this is evident. The free compound is absorbed too quickly. The ester is gradually split within the body, however, and thus exerts a more lasting effect.

Estrogenic substances were first proved to be present in the Graafian follicles. It has not yet been definitely decided whether the estradiol occurs in the fluid of the follicles.[12] The cheapest source of estrogenic substances is pregnancy urine, which contains relatively large amounts of these hormones.

*It should be said that dihydro-androsterone (androstanediol) is four times as effective (capon units as well as seminal vesicle units) as androsterone. It has not yet been obtained from natural material.

Fortunately all the male sex hormones and also the otherwise very difficultly obtainable corpus luteum hormone have now been synthesized. It is really not exact to use in these cases the term "synthesis", since only a chemical transformation of certain sterols has been carried out. In most cases the easily obtainable cholesterol is used as starting material. Estrogenic substances have not yet been obtained by means of such transformation. Apparently it is not easy to eliminate one of the two CH_3-groups of the sterol molecule, a task which is performed by Nature without any difficulty. One feels convinced, however, that the chemical geniuses will solve this question within a short time.

TABLE NO. III*

PHYSIOLOGICAL ACTIVITY OF THE SEX HORMONES

1 γ (gamma) = 0.001 mg.

I. MALE SEX HORMONES

Name of the hormone	Weight of the hormone containing 1 capon unit
Androsterone	200 γ
Dehydro-Androsterone	600 γ
Testosterone	30 γ

II. FEMALE SEX HORMONES

A. Corpus Luteum Hormone

Name of the hormone	Weight of the hormone containing 1 rabbit unit. (Corner and Allen, Clauberg)
Progesterone	0.5—0.75 mg.

B. Estrogenic Hormones

Name of the hormone	Weight of the hormone containing 1 mouse unit	
Estrone	0.025—0.5 γ	Under equal conditions of administration the Estradiol is 6 times as effective as Estrone
Estradiol	less than 0.03 γ	

Many other interesting facts could be told about the sex hormones, such for instance as the relationship between estrogenic hormones and substances producing cancer. Recently the question was raised

*International units referring to certain amounts of weight of chemically pure sex hormones were recently established by the Health Organization of the League of Nations:

Estrogenic Hormones: 0.1 gamma either of the free hormones or of their benzoates are 1 International Unit. The biological activity of 1 International Unit thus varies with the different estrogenic substances.

Corpus Luteum Hormone: 1 milligram of progesterone is 1 International Unit.

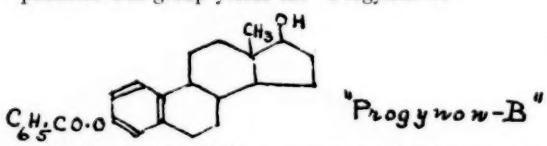
Male Sex Hormones: 0.1 milligram of androsterone is 1 International Unit.

(Report of the second conference on the standardization of sex hormones, held in London, July 15 to 17, 1935. League of Nations. Quarterly Bulletin of the Health Organization. Vol. IV, 618 [1935]).

XUM

whether sufficient doses of estrogenic hormones, known to cause proliferation of the mucous membrane of the vagina, are capable of bringing about similar effects on other kinds of tissue, thus perhaps causing cancer. It has been established that substances which are chemically related to the estrogenic hormones are really cancer producing.[13] Even estrogenic substances themselves are now said to be capable of producing cancer.[14]

One should briefly mention the commercial preparations of the specific sex hormones. There are not yet any preparations of the male sex hormones on the market in this country.* The benzoic acid ester of the androsterone is distributed in Germany under the designation "Proviron" (Schering-Kahlbaum, Berlin). A paper dealing with the clinical value of this preparation was recently published by von Bergmann.[15] There exist several brands of estrogenic preparations. The "AMNIOTIN" of E. R. Squibb & Sons is an estrogenic preparation which was originally derived from amniotic fluid. More recently the urine of pregnant mares has served as an added source of active material. The preparation is not brought to the crystalline state during manufacture. The "THEELIN" of Parke, Davis & Co. is the crystalline estrone, which was first isolated by Doisy and Butenandt. It is obtained from the urine of pregnancy. The "THEELOL" of Parke, Davis & Co. is the crystalline estriol, or the hydrate of the estrone: It is likewise obtained from the urine of pregnancy. "Progynon-B" of the Schering-Corporation represents the benzoic acid ester of estradiol (dihydro-follicular hormone). Estradiol can easily be obtained from estrone by means of a hydrogenation; thus the keto group is transformed into a secondary alcohol group. A benzoylation of the phenolic OH-group yields the "Progynon-B."



Until recently satisfactory commercial products of the corpus luteum hormone were not available. The only preparation which apparently meets the requirements is the "PROLUTON" of the Schering-Corporation.

*Addition, being made while reading the proof (August, 1936): Very recently commercial preparations were put on the market by the Schering Corporation (Bloomfield, N. J.) and the Ciba (New York, N. Y.)

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ANENCEPHALUS—EXHIBIT OF FOUR FOETI—WITH CASE REPORTS.

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I wish to state that this is not intended as a research work on anencephalus, nor even a real paper on the subject, but simply a report of four cases presenting a variety of signs and symptoms. The chief object in reporting these cases is that I believe there really is a practical significance, which fact I will attempt to demonstrate.

Before the days of pre-natal care anencephalus meant nothing to the medical profession except as an item of scientific interest. The condition, while rare, is one of the commonest of all foetal abnormalities.

In a series of 325 cases of monstrosities studied by Ballantyne,[1] this abnormality was present to the extent of 14 per cent.

It is rather remarkable to note that there is an almost constant presence of hydramnios associated with this and other types of foetal monstrosities. In a rather extensive review of the literature, I failed to find any explanation of this occurrence, except a theoretical one. Schmidt[2] believes that a lessened absorption is a most important factor. I have no explanation, theoretical or otherwise, to make. All authors state its frequent occurrence. In all four cases here exhibited this condition was notably present.

The first successfully diagnosed case of anencephalus before birth was in 1916 by Case.[3]

Of the four cases here presented, in only one instance were roentgenograms made, and these pictures were made solely for the purpose of diagnosing pregnancy. However, the one picture here exhibited demonstrates this foetal abnormality. If the hormone test for pregnancy, now widely used, had at this time been in vogue, there would have been no need for roentgenographic study of this patient in regard to positive diagnosis of pregnancy. But as the film shows, there should be a much greater use of roentgenology wherever anencephalus is suspected.

REPORT OF CASES

Case 1.—This case was seen first by me during labor. There had been no pre-natal care of any kind. On examination, I made a provisional diagnosis of a face presentation. The woman was so obese that abdominal palpatation yielded no definite information. Cervical dilatation was found to be approximately three fingers. The membranes were ruptured artificially and about two and one-fourth gallons of fluid poured from the Kelly-pad into the basin. The patient had not felt foetal movement for three days.

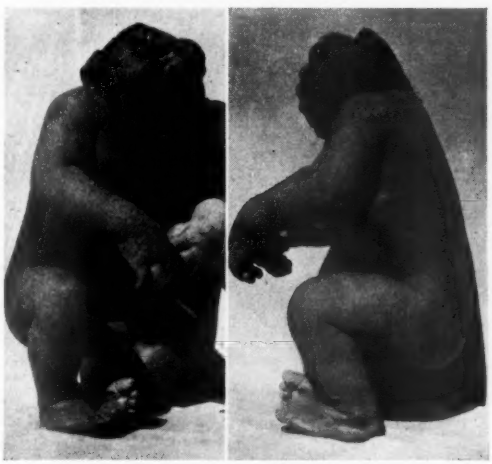

Fig. 1.—Anterior and lateral views of Case No. 1. (Duration of pregnancy: thirty-seven weeks.) Face presentation. Spontaneous delivery.

Case 2.—The woman who was delivered of this specimen was twenty-one years of age and a multipara. She had given birth to one normal child which was two and one-half years old at the date of this delivery. I had not seen the patient before the onset of labor. Clinically, she was having excruciating and very frequent pains with apparently no progress toward spontaneous delivery. On bimanual examination I felt what I thought to be a frank breech presentation, this provisional diagnosis later proving correct. The membranes had not ruptured and on account of the huge size of the abdomen and inability to properly feel foetal parts with my abdominal hand, I ruptured the membranes and found a condition of extreme hydram-

XUM

nios. Under chloroform anesthesia the foetus was extracted by the typical maneuver. Although this was my only case of breech presentation of anencephalus, several authors have found this condition present and, while they give no particular reason, I believe it would often occur because of the lack of a natural head to normally present itself.

Fig. 2.—Case No. 2. Full-term child. Frank breech presentation. Delivery by extraction.

The specimen you see here exhibited has been purposely placed in this position in the jar so as to show its actual presentation.

In this instance the patient had felt movements up to within twenty minutes of delivery. From the history of the case as to menstrual cycles, the time patient first felt movements, and the size of the foetus, I consider this to have been a full-term child.

It is rather a remarkable coincidence, I think, that, as rarely as this condition is found, these two cases occurred within one month of practice.

Case 3.—The case now under consideration was not mine personally, but through the courtesy of Dr. T. H. Clarke and Altamont Hospital, I am including it in this report, especially for the reason that I wish to show the importance of roentgenographic study in cases of suspected anencephalus.

Pre-natal care had begun about one week previous to delivery. At that time the chief complaint was inability to feel foetal movements. It was determined from the menstrual history and other factors that the patient had been pregnant for approximately thirty-three weeks.

On December 3, 1932, roentgenograms were made to determine absolute presence of pregnancy. At this time the woman was an outside patient. On December 8th she was admitted to the hospital complaining of pains resembling those of labor.

Fig. 3.—Case No. 3. Length of pregnancy approximately thirty weeks. Spontaneous delivery.

She had a spontaneous delivery the same day, Dr. Clarke attending her. Hydramnios was found to be present.

The roentgenogram exhibited here, while made for other reasons, shows the presence of this foetal abnormality. The mother of this foetus was later

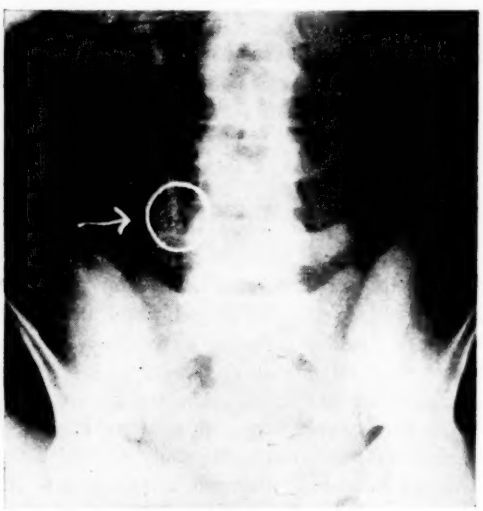

Fig. 4.—Roentgenogram of Case No. 3. Note absence of calvarium shadow.

under my care and, while she and her husband apparently greatly desired a child, fear was expressed that "it might be like the other one." I believe that we should spare the parents, if possible, from

knowing that such a birth had occurred because, in my review of the literature, a recurrence has never been reported.

Case 4.—The mother in this case had had five normal births before delivering this monster. I saw the patient at home, in hard labor, on November

Fig. 5.—Case No. 4. Two views of twin pregnancy. (One normal foetus, one anencephalic.) Length of pregnancy approximately twenty-one weeks. Spontaneous delivery of the normal foetus; anencephalic monster delivered by version and extraction.

21, 1933, two hours before admission to hospital. I advised hospitalization because of the inability to palpate a definite foetal part either abdominally or vaginally. There was an abnormal amount of show, enough to suspect placenta previa, and even a Caesarean section was contemplated, but later abandoned. Manual dilatation of cervix was performed and the normal foetus you see here (about five months) was delivered. This child lived one hour and fifty minutes. On rupture of the membranes extreme hydramnios was found to be present, and on this sign alone a provisional diagnosis of foetal monstrosity was made.

With the expulsion of the placenta another mass in utero was felt, and the anencephalic monster shown here was delivered by version and extraction. This is the only case I can find on record of multiple pregnancy with this condition present.

SUMMARY

In summarizing this report, I wish to stress three points:

1. The patient bearing an anencephalic monster, particularly if she be a primipara, should, if possible, be kept in ignorance of the fact.
2. Whenever hydramnios is found clinically, a foetal monstrosity should be suspected and so diagnosed until proven otherwise.
3. With proper pre-natal care, anencephalus should and can be diagnosed about the fourth or fifth month of pregnancy. If found present, pregnancy should be interrupted and the mother spared the torture of continuing a vainless expectancy of normal child-birth. Constantly improving technique of roentgenography has and will aid greatly toward attaining this goal.

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OPTIC RETROBULBAR NEURITIS OF NASAL ORIGIN.*

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Occasionally it seems wise, in the language of the road, to stop, look, and listen. This is for the purpose of reviewing our knowledge, seeing whether we are making the best use of what we know and are not forgetting to put our knowledge into use.

In a recent article by James A. Fisher on the subject of retrobulbar neuritis as a result of sinus infection, he gives a review of literature, quoting a number of authors who have written on the subject, many of them entirely against the use of surgery in this form of infection of the optic nerve, holding that they have seen no definite connection between the two.

My own ideas are totally at variance with these,

*Read before the Virginia Society of Otolaryngology and Ophthalmology at its annual meeting in Richmond, May 2, 1936.

and my experience has borne me out that operation is indicated where there is definite crowding of the middle turbinate against the septum in cases of unilateral retrobulbar neuritis. A brief glance at the anatomy of this region will reveal the intimate relationship of the optic nerve to the posterior ethmoid cells and sphenoidal sinus as it passes from the cranial cavity into the orbit. There is a great variation in the relationship of these cavities to the optic nerve, and also decided differences in the size of the optic foramen in different skulls. Symptomatology of retrobulbar neuritis of nasal origin may vary slightly, but in general would be very much as follows:

A sudden loss of vision to greater or less extent from slight blurring to complete loss of the possibility of seeing anything except moving objects. When it begins with slight blurring, the vision is liable to get progressively worse until the condition causing it is relieved. Examination of these eyes usually reveals a perfectly normal fundus. The field of vision shows narrowing for red and enlargement of the blind spot. Examination of the nose shows narrowing of the nasal fossa high up with crowding of the middle turbinate against the septum on this side, resulting in deficient aeration and drainage of the ethmoid region, therefore venous engorgement and hyperplasia. X-ray examination of the nose usually gives no definite picture, for in my own experience, pus in these cases is more often absent than present. The symptomatology of these eyes is of exactly the same character as that of toxic amblyopia, such as comes from alcohol, tobacco, quinine, etc., but, in the cases of this latter type, the condition is always bilateral, while in those due to ethmoid conditions, the trouble is unilateral or, if it is bilateral, the length of time between the eyes being involved is usually marked, while in toxic amblyopia from drugs, the loss of vision in the two eyes is simultaneous.

In discussions of this character of blindness, I heard Dr. Ross Skillern say that when he met with a case of this kind, with nasal symptoms such as I have described, he operated for drainage of the ethmoid region first, and discussed it afterwards. This is my own opinion. This type of blindness has some elements of toxemia, but also in my own opinion, pressure is to a certain degree a causative factor, for, with the exception of hyperemia and hyperplasia of the nasal mucosa in the ethmoid region, there is no definite pathological condition and no departure from the usual bacteriological flora of the nose. So many cases in my hands have responded to this form of operative treatment, that it would be useless for me to think of approaching them from any other viewpoint, unless definite proof against it was shown.

That pressure exercises its influence was proven to me by a case which came under my care where an attempt had been made to irrigate the antrum through the natural opening. The fluid did not enter the antrum, but entered the ethmoid cells and was almost immediately followed by reduction of vision down to 20/50. The vision returned in forty-eight hours when the fluid drained out, but this one case proved to me what pressure of moderate amount in the ethmoid region could do to an optic nerve.

While it seems to me advisable to operate promptly on these cases when definite loss of vision has been observed, still they are not hopeless when the condition has existed for a long time. There recently came under my observation a lady, aged forty-eight, who had for six months been complaining of loss of vision in her right eye. She had been in the hands of a competent ophthalmologist, but he, apparently, had not recognized the cause of her lowered vision. Her vision was 20/100 in this eye. She had interference with breathing high up on the right, the middle turbinate was crowded against the septum, and a marked hyperplasia. The middle turbinate was removed, and the posterior ethmoid cell uncapped. This was followed in two weeks' time by improvement of vision to 20/40, and with proper reading glasses, she could read J.1 at fourteen inches with perfect comfort. A recognition of these cases and the need for their relief is certainly of importance, and in spite of all the literature on the subject against operative work, and the statement that these cases recover in spite of and not because of the operation, it is still my opinion that they should be operated upon. It is possible that where there is an absence of pus and there is simply an engorgement and hyperplasia to deal with, a careful regulation of the diet and bringing the system to autonomic level may so improve the aeration and drainage in this region that the vision would be restored. But this is a very much slower method of approach and one which may not restore

the mucous membrane to normal, and the sacrifice of a middle turbinate, which on account of its crowded situation is not normally functioning, is such a small matter as compared with the loss of vision in one eye that the choice to me is obvious.

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Stuart Circle Hospital.

FRACTURES OF THE HIP.*

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Fracture of the hip occurs in two forms, and they are of entirely different prognosis as to union and as to recovery of function.

The first form is the extracapsular fracture, where the bone is broken in the region of the trochanters, outside the attachment of the capsule of the hip-joint (Fig. 1). Here there are large masses of

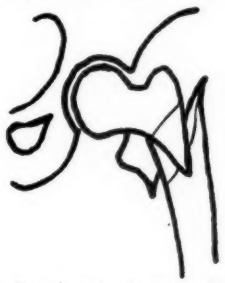

Fig. 1.—Extracapsular fracture of the hip.

muscle attached all around the break, with abundant blood-supply everywhere; so that, no matter how severe the fracture appears, it will practically always heal at once by solid bone. In fact, the worse it is comminuted, the better it will heal.

Treatment of this fracture may be condensed into one word—traction, simple traction with weight and pulley, with a little flat pillow under the trochanter to keep it from dropping down and out, the foot of the bed elevated a little, so that the weight will not pull the patient down in bed. The whole leg should be a little abducted, not to the point of discomfort. A back-rest may be used at once if you like. Care should be taken that the bedclothes do not maintain foot-drop.

More recently, if you wish, the Roger Anderson "well-leg" splint may be applied, as this permits the patient to be up in a chair quite soon.[1] This splint is not quite as simple as it looks, but it works well.

It generally takes about ten to twelve weeks for union to be solid enough to allow dispensing with traction. The patient can then be up and about, on crutches, but should not bear any actual weight for another month, and full weight not until the X-ray shows solid union—a matter generally of six months at the least from the time of injury.

Please note that these are not cases in which you best use the Whitman cast as a rule; this may only hold position very imperfectly in such fractures, and may allow an entirely unnecessary shortening to take place.

The general care of the patient and good nursing are, of course, of prime importance; you are all familiar with this.

The second form of broken hip is the fracture through the small part of the neck of the femur proper (Fig. 2). This is an entirely different prob-

Fig. 2.—Intracapsular fracture of the hip.

lem from the simple one noted above. It is, to quote recent authority, the unsolved fracture.[2] Records of large numbers of cases, treated by experts, show a percentage of bony union of not over 65 per

*Read at the sixty-six annual meeting of the Medical Society of Virginia in Norfolk, October 15-17, 1935.

cent as a rule, and in a report just published, only 53 per cent.[3] When not treated by experts, the results are still less brilliant. This is very discouraging, for without bony union there is generally a good deal of permanent crippling.

The reason for this poor outlook is twofold: First, it is difficult to be sure of really good reduction; and, second, the blood-supply here is very scanty—so poor that the head of the femur quite often becomes actually necrotic, though without infection, and its slow replacement with new bone must accompany bony healing of the fracture.[4-5]

As to reduction, most broken bones will eventually give satisfactory results if corner-on position of the fragments is attained; but this fracture demands a quite exact position, with the whole extent of the raw areas accurately approximated; otherwise, enough union to bear the body weight may never be built up.

From their very nature, hip fractures are inevitably difficulty to treat. The broken bones are inaccessible to direct palpation, and can only be controlled by indirect manipulation at a distance.

Furthermore, the X-ray appearances may be very deceiving, since the shadow is easily distorted by any rotation of either fragment. The stereoscopic view is of help, and so is the newly developed lateral view, when it can be made clear enough to distinguish some of the details; but it is an expert's task to state flatly the precise relations that the broken ends of the bone bear to one another.

These lateral X-rays, and the findings at open operation, have shown that we have been deceiving ourselves from time to time as regards the accuracy of our reduction.[6] And end-to-side union, while quite all right for the intestine, is not all right for the neck of the femur.

Let me turn now to the other cause for poor results in this fracture—namely, poor circulation. It is in this connection that I wish to call your attention to the fact that there is one type of fracture of the femoral neck in which bony union does regularly occur—namely, the impacted fracture. The broken surfaces are not only in contact, but intimately blended into one another, and adequate blood-supply is carried across the line of fracture at once. This accidental impaction cannot always be allowed to remain, because of poor position; but when it does remain, bony union seldom fails.

There is a simple method of producing such impaction artificially; and when this is done, the same favorable chance of healing is apparently present, as when impaction has been caused by the injury itself. The method is that of Cotton, of Boston, and was described some years ago, though for some reason it has not yet been generally adopted.[7]

In brief, the patient is treated as in the standard Whitman method, with the essential addition that after correct reduction is attained, the neck of the femur is deliberately driven in toward the head, and the fracture impacted into itself by striking a few solid blows over the trochanter with a heavy mallet, using felt padding to protect the skin. Then the usual Whitman abduction cast is put on.

This procedure is simple and entirely logical, though for some reason it has been little used. I am convinced that failure to use it is definitely responsible for a portion of the bad results that are being reported.

Correct reduction of this fracture is so essential that, if the bone cannot be gotten quite exactly and definitely into position by manipulation after the Whitman method or its modifications—for instance, that of Leadbetter, of Washington,—it seems to me that it is entirely justified, if not demanded, to assure such correct reduction by open operation, as described by Boszan[8] and others.

A number of authorities have recently revived internal fixation by means of pins, multiple wires, or pegs;[9-10-11] these appliances have been put in sometimes by open operation, sometimes subcutaneously. The procedures require a considerable degree of exactness in their application.

For some reason, while I am distinctly in favor of using open fixation in other fractures, I would still prefer to avoid metal pins and so on in fractures of the neck of the femur. I am not at all sure that I am logical in this preference, but there it is—the personal equation;—and I am so impressed by the certainty of healing of impacted fractures in general that if I were to use wire or pin fixation, I should still add the procedure of artificial impaction.

Simple traction, either with weight and pulley, or with the Anderson splint, does not usually solve the problem here, and in general it is probably a waste of time to try it.

Do not forget that union in these fractures is exceedingly slow—a matter of a year or so. Therefore, the cast must not be discarded too soon; and

when it is discarded, it is wisest to apply a well-fitting Thomas caliper brace, permitting the weight to be borne on the tuberosity of the ischium. And for many months, crutches are, of course, the patient's best friend.

The process of healing is to be carefully watched by the X-ray for a very long time; for even after apparently solid union, the head of the bone may still disintegrate under active weight-bearing, as the researches of Phemister point out.

To recapitulate, extracapsular hip fractures unite by bone; treatment is simple in principle and successful; it is summarized in one procedure—traction. Intracapsular hip fractures are without doubt the most difficult fractures in the whole body to treat successfully. They unite by bone in only 50 per cent; there is as yet no general agreement as to the best treatment. Results can be improved, I am convinced, by the Cotton artificial impaction. Correct position is so absolutely essential that open operation is, I believe, entirely justified if need be.

It is possible, I think, to treat extracapsular hip fractures in the home if circumstances require it, though I certainly do not advise it; but the fracture of the femoral neck, within the capsule of the hip-joint, can only be handled in the hospital if any reasonable chance of union is to be assured.

These two types of fracture, occurring within two inches of each other, are as wide apart as the poles in their prognosis, and in the difficulty of their treatment.

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NON-UNION OF FRACTURES OF THE HUMERUS.*

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It is unpleasant, but instructive to report one's failures. I believe that we ought to report failures as well as successes in our practice and that often we may learn more from one poor result than from fifty good ones.

With this in mind, I shall discuss, with slides from X-rays, five cases of persistent non-union of fracture of the shaft of the humerus and one case of long delayed union, but with a final excellent result. These cases have been chosen from a fairly extensive experience in fractures of the humerus because they were failures in treatment. They represent, fortunately, only a very small percentage of the total number of humerus fractures which we have treated.

Of the five cases of non-union, all were in the middle third of the humerus. (I cannot recall seeing a case of non-union elsewhere in the humerus.) Three were simple transverse fractures. Two were compound and badly comminuted. Four of the five were caused by severe trauma,—one in a train wreck, the other three in automobile accidents. Three were complicated by other injuries, which affected the treatment and were probably a factor in the non-union. Only one was in a young man, while two of the patients were in the sixties and the other two were forty-six and fifty-four years old, respectively.

Three of the cases had bone graft operations, one of these being operated on three times, but non-union occurred even after operation. Two of the cases showed a musculo-spiral paralysis which later cleared up.

While we have treated a large number of cases of fractures of the shaft of the humerus with excellent results, the occurrence of five cases of persistent non-union is discouraging. The experience of other clinics is somewhat similar. Sever[1] reports three

*Read at the sixty-sixth annual meeting of the Medical Society of Virginia in Norfolk, October 15-17, 1935, *with lantern slides.*

cases of non-union in his practice. H. Rogers,[2] in a report of end results in forty-two cases from the Massachusetts General Hospital, had five cases of non-union in which twelve operations were necessary to obtain union. Smyth,[3] in a series of sixty-nine cases, reports only one case of non-union, but all patients were treated in the hospital and eleven of them were operated upon and a Sherman steel plate and screws applied as the primary treatment.

Non-union is certainly more frequent in the middle third of the shaft of the humerus than in any other bone. I believe this is due to several factors. Primarily, the difficulty is in obtaining perfect reduction and adequate immobilization of the fragments. This is shown in some of our cases. Probably also the primary injury interferes with the blood supply to the bone, as this is the region of the nutrient artery. In two of our cases the compound injury and the comminution of the bone were probably factors. Too much traction, with separation of the fragment ends during the period of early repair, as in two of our cases, may occur merely from the weight of the arm, and tends to cause non-union. Lack of callus formation may be a constitutional factor, but it cannot be predicted, nor can it be explained. In all of these cases, the Wassermann was negative and the general condition of the patients, except in one, was good. In the case of delayed union there was no discernible cause for the delay except inability to form callus in the usual length of time. Sever[1] says "I believe that there must be some intrinsic cause for non-union in fractures of the humerus that is not wholly understood." I agree with him.

CASE REPORTS

A.—Miss H. W., age sixty-five years. Knocked down by automobile December 12, 1930. Compound, badly comminuted fracture at junction of upper and middle thirds. Debridement on admission. One fragment ¾x½x¼ inch lost. Closure and abduction splint. After reduction X-ray showed anterior displacement of lower main fragment. No infection.

Position was improved, but slight outward and anterior displacement of lower fragment persisted. Union did not occur.

May 13, 1931. Massive bone graft operation done. Kangaroo tendon around bone to hold graft. An attempt was made to fix graft to bone with bone pegs, but fragments were so soft that pegs would not hold. Uneventful convalescence.

X-ray June 10th showed some outward angulation and the graft did not appear in contact with bone at its extremities. Some callus formed, but not enough for union. X-ray January 18, 1932, showed beginning absorption of graft. Union did not occur. Reasons: (1) The extensive injury with loss of bone; after graft, callus did not form. (2) Insufficient contact of graft and age of patient.

* * *

B.—J. T. T., age forty-six years, railroad engineer. Admitted November 24, 1932, after railroad accident. Concussion of brain; fracture of coccyx and sacrum; transverse fracture through middle third of left humerus, simple. This latter was reduced under fluoroscope three days later and an abduction splint applied. X-ray showed satisfactory reduction. One month later (December 22nd) X-ray showed good position and a good deal of callus. Discharged from hospital January 11, 1933. Complication—musculo-spiral injury. Wore the abduction splint about eight weeks, then coaptation splints and sling. Musculo-spiral paralysis cleared up under appropriate treatment.

Union did not occur and February 6, 1934, he was re-admitted for bone-graft. After making a bivalved spica, the arm was operated upon. Bone ends were freshened and a sliding, inlay graft was used from upper fragment and held in place by silver wires. Post-operative position was not perfect, but the contact of graft was considered sufficient. On July 7, 1934, there seemed to be fair union. On August 20th, graft showed a fracture. Result—failure.

He has refused another operation and is back at work as a hostler. Reason for non-union: Fragments showed slight separation and a sliding graft used. Massive bone graft should have been used.

C.—W. R. S., age twenty-five years. Transverse fracture in middle third of left humerus November 20, 1932. Closed reduction and no trouble until April 23, 1933, when he fell and broke it at same level. Operated on the next day by another surgeon and a bone peg from tibia was used, inserted into medullary canal of each fragment. Thomas splint applied. Both fractures transverse through middle of humerus. One-half inch gap between fragments. Union did not occur. Had musculo-spiral paralysis which cleared up.

At operation November 4, 1933, peg was found adherent to upper fragment with excessive scar tissue around the area. Three-inch long, thick graft from tibia used, placed in groove in fragments and held by kangaroo tendon. Post-operative X-ray showed poor position of graft. Ten days later the incision was re-opened and graft wired in position. X-ray showed better position, but not perfect.

X-ray three months later showed definite callus formation and what appeared to be union. Clinically union was present. Six weeks later he picked up a suit case and pain occurred. X-ray (April 2nd) showed fracture through middle of graft.

Union did not occur. Later another surgeon operated with non-union resulting. The patient also had the misfortune after this to fracture the tibia from which the graft was taken. Reason: Operation not perfect, but union occurred. Probably longer protection would have caused firm union. Bone graft should have been more massive.

D.—J. W. N., age fifty-two years. Compound, comminuted fracture through middle of left humerus. Multiple fractures of left ribs June 6, 1931.

Debridement on admission and Jones humerus splint, as abduction splint could not be used because of injury to chest.

X-ray showed end to end apposition, but outward angulation. No infection. Uneventful convalescence.

June 16th.—Under fluoroscope there was found a slight gap between fragments from too much traction. This was corrected by lessening the traction and coaptation splints were added to Jones splint.

July 20th.—X-ray showed 50 per cent apposition of fragments and good callus.

A large amount of callus formed, but not between fragments or on outer side. After six weeks internal right-angle splint was used.

Callus continued to form, but union did not get solid.

November 9, 1931.—Clinically non-union. Bone graft advised but patient did not return for it. Reasons: Too much traction in stage of early repair. Imperfect apposition.

E.—W. J. C., age forty-nine years. Simple comminuted fracture about middle of left humerus, from automobile accident June 9, 1934.

Same day, under sodium amytal, abduction splint applied and perfect position of fragments obtained.

Very slow formation of callus. Splint kept on for twelve weeks, then right angle internal splint. Later coaptation splints and sling. Not until January 4, 1935, was there sufficient clinical and X-ray evidence of union to remove splints. On May 20, 1935, after physiotherapy in another city, solid union with excellent function. Under treatment nearly twelve months. Reasons: None, except slow formation of callus.

F.—Rev. J. S., age sixty plus. Transverse fracture of middle third of left humerus. Complications: Fractured skull, multiple fractures of left ribs with pneumothorax—myocardial degeneration.

Jones splint and distraction of fragments. When traction was completely released, there was still some distraction. Open reduction was advised against by his physician because of cardio-vascular disease. Better position was obtained ten days later, but the case went on to non-union. Because of severe cardiovascular disease, no bone graft was attempted. Reason for non-union: Because of complications, reduction was not possible early. Also muscle between fragments.

SUMMARY

Five cases of non-union and one case of delayed union of the middle third of the shaft of the humerus are reported.

In two of these cases, non-union was due to imperfect early reduction. Both were treated by the Jones humerus splint which allowed the fragments to be pulled apart.

In the three cases which were bone grafted, a mistake was made in one by using a sliding graft from bone which, because of non-use, was probably not active in bone forming elements. In another, the graft could not be firmly fixed in place because the fractured bone was too soft to hold bone pegs. In the third, adequate fixation was not maintained sufficiently long for solid union, and the graft was not massive enough.

In the case of delayed union, no explanation is offered, other than slow callus formation.

CONCLUSIONS

Fracture of the shaft of the humerus in the middle third is a serious problem.

In transverse fractures, if good position and contact of the fragments is not obtained in the first two or three days and is not held by whatever splint is used, it is best to operate and hold perfect contact by means of a Sherman plate and screws with also

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an external splint or plaster cast. (In badly comminuted fractures, as were two of ours, this, of course, cannot be done.) If a splint be used, a modified Osgood-Penhallow splint is best. A traction splint should not be used. A plaster shoulder spica has been efficient in many cases.

If non-union occurs, the best operation is a massive bone graft taken from the patient's tibia and fixed to the freshened fragments by bone pegs made from the tibia, as advocated by Campbell[4] or by beef bone screws, as advised by Henderson.[5] Even with this operation, some failures will result.

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Medical Arts Building.

DISCUSSION* OF PAPERS BY DRS. TODD AND FAULKNER

DR. M. H. TODD, Norfolk: May I discuss Dr. Faulkner's paper and call attention to the same thing that Dr. Mauck just mentioned. The real difficulty in treating fractures of the upper arm is that casts and splints do not hold the bone firmly enough; in fact, even traction in bed is not as steady as desirable.

The other thing I wish to mention is that it is the square break, or more particularly the break with curved ends, that is apt to result in non-union. In such cases, if good fixation cannot be attained by closed methods, much time and uncertainty will be saved by open fixation with a steel plate.

Sherman told me some years ago that he had never had a non-union where his plate was used; and I have seen large series of fracture patients at his clinic, with the most perfect results imaginable. I cannot myself claim a similar perfection, but my experience with open fixation has, none the less, been exceedingly satisfactory.

DR. C. H. PETERSON, Roanoke: I think that the intracapsular fracture of the femur is best fixed by use of the flanged stainless steel pin. This operation was devised by Dr. Heyward Wescott, of Roanoke, who has used it for the past five or six years. I am sorry that Dr. Wescott could not be present to take part in this discussion. I was associated with Dr. Wescott in the experimental work and am interested in it chiefly from the anatomical and roentgenological standpoint. The technic of measuring the two angles of the femoral neck and inserting the pin have been described in several articles and time does not permit a full discussion of the method. The patient is operated upon as soon as he has recovered from the shock of the injury, preferably within twenty-four hours. X-ray films are made before and during the operation and the Smith-Petersen nail is driven directly through the femoral neck after the fragments have been reduced. Only a small incision is necessary and a light general anesthesia used. The patient is given a back rest, wheel chair and crutches as soon as he has recovered from the anesthetic. No external fixation is used.

This operation by Dr. Wescott eliminates (1) operation into the joint, (2) exposing the fractured surfaces, and (3) fixation in plaster following reduction. As Dr. Todd mentioned, impaction is important and this is done in the course of the operation. Good union is obtained in a much larger percentage of cases than by any other known method.

DR. TODD (closing his discussion): I am very much obliged to Dr. Vann, in calling attention to a very important thing that I had not mentioned, more or less from over-sight. The matter of rotation is exceedingly important and must by no means be neglected. Curiously enough, in fractures of the shaft of the femur, put up in the usual traction splintage, the lower fragment is apt to be held in relative inward rotation, the foot being fixed vertically. (I did not know this until I encountered a fracture of both femurs: I treated him in the usual manner, and when he began to walk, I noticed that he was pigeon-toed.) By contrast, it is outward rotation of the lower fragment that is to be guarded against, in hip fractures.

Dr. Vann spoke of one other thing that I wish to emphasize strongly: whenever any elderly person complains of pain in the hip after a fall, he very probably has a broken hip, and is to be treated with great care even if the X-ray is negative. I have been misled by a negative X-ray and have caused a patient to try to walk, when a fracture was none the less present—a second film then showing definite deformity.

The purpose of my paper, in summary, was to bring out the importance of differentiating between the two entirely different kinds of hip fractures. One variety is relatively easily treated and unites by bone; the other variety is most difficult to treat, and even in the hands of experts may give poor results.

DR. FAULKNER, closing his discussion: May I just speak a word on Dr. Todd's paper. I enjoyed it and I think the work excellent. The Russell traction has worked with us quite well. I can't say that I am enthusiastic about open operation in intracapsular fracture on the hip. I believe it is too much to put on them, particularly on the old patients.

I want to thank Dr. Mauck and Dr. Todd. I don't agree with Dr. Mauck saying that a fracture of the humerus should not be perfectly reduced. I believe that

*Other discussions not corrected and returned.

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you can get more union by perfectly reducing them. If you can get them impacted and then hold them with a Sherman plate and screw, I think that it is safer than any other way.

If you have a transverse fracture, of which Dr. Todd speaks, that is virtually the best form of treatment if everything else is safe for open operation.

In the oblique fracture or compound fracture, I think what Dr. Mauck says is right and I believe that you get a better union than if they are perfectly reduced.

I thank them both for their discussion, and there is one other thing Dr. Mauck said about massive grafts. I agree with him. In only one of these cases was a truly massive graft used. In another the graft, while broad and of full thickness, was not long enough to be termed massive. The massive graft should always be used.

CONGENITAL ABSENCE OF RIGHT FALLOPIAN TUBE AND OVARY.*

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and
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In view of the comparative infrequency of reports in the literature of congenital absence of a fallopian tube and ovary, we feel that the following case report will be of interest.

Mrs. E. A., white, age 23, married, housewife. Patient had married in 1929 at the age of 17 and had lived with her husband for only one year. Her second marriage took place one year ago. The family history is entirely negative.

In 1930, the patient had a probably induced abortion at about the second month of gestation. In 1933, she menstruated more freely than normal, passed clots, and was told that she was anemic. This condition cleared up spontaneously in about six months, and she has been well since except for abnormal nervousness.

Menstruation began at 13, twenty-eight-day cycle, always regular, lasting from five to six days, with a great deal of pain, most marked in the left pelvis, during the first two days.

The patient was seen by us on October 4, 1935. She had menstruated on August 17th, this period being entirely normal. Had had no symptoms of an early pregnancy, but complained of nervousness. Two weeks previously she had an attack of lower left abdominal pain, sharp, stabbing in character, and lasting for only a short time. Since that time, this pain has recurred several times, and for two days previous to examination she had had almost no relief. Pain was still intermittent, located in left pelvis, and not referred. The pains had been lancinating and close together. On the morning of examination, she noticed a spot of bright red blood. There had been no bleeding prior to or since that time.

Examination.—Patient was a well-developed female, well-nourished, but very nervous, weeping frequently with no apparent provocation. Head negative, heart and lungs negative, abdomen flat, negative to palpation except for marked tenderness and spasm of the rectus muscle on the left side just above the pubis. Pulse 80; temperature 99.6; B. P. 112/70.

Pelvic examination: Pelvic floor normal; no vaginal bleeding, cervix normal, uterus normal in size, shape, and position; freely movable but painful, the pain being referred to the left side. Right pelvis negative. In left pelvis there was a mass, size of an orange, smooth in contour, firm, and acutely tender. The mass had the contour and consistency of a cyst. The examining finger was found to be covered with blood when withdrawn.

Laboratory: Urine—sp. gr. 1024; albumin slight trace; W. B. C. 2 to 3; R. B. C. innumerable. Blood—W. B. C. 9,600; differential—P. M. N. 81 per cent; R. B. C. 3,100,000; Hb. 82 per cent; Wassermann negative.

Diagnostic possibilities (1)ovarian cyst; (2)hydrosalpynx; (3)one of these complicated by a tubal pregnancy.

Laparotomy was done with the following findings: The left ovary, size of a small grape-fruit. The

*Read before the Alleghany-Bath County Medical Society, April 23, 1936.

ovary and tube were attached to several loops of the small bowel and sigmoid. The tube and ovary were dissected free and removed.

On the right side no ovary or tube could be found. There was a bud-like projection the diameter of a normal tube about ½ cm. long at the right cornu of the uterus. Diligent search failed to reveal even a rudiment of the ovary on this side which we realized might be abnormally placed.

The left ovary measured 6½x4½ cm. with a large hemorrhagic cyst. On section of the ovary, masses of primordial, developing follicles, corpora albicantia, and organizing corpora lutea were found.

The appendix was chronically diseased.

Later, pyelograms were made which revealed that the kidneys were both present and normal. This is interesting because of the reported frequency of concurrent anomalies of the kidney and the female genital anomalies. It will be recalled that the uterus and vaginal canal are formed by the union and fusion from below upward of middle and lower two-thirds of the Mullerian ducts. The fallopian tubes are formed from the upper third of these two ducts. The ovaries originate from the genital ridge which lies in the wall of the coelomic cavity, and the kidneys have almost the same origin as the ovaries.

Six months have elapsed and the patient has had no sign of menstruation. There are definite menopausal symptoms, which, fortunately for her, are being well controlled by the use of follicular hormone.

We herewith append previous reports of like cases.

In 1919, Dr. B. O. Robertson, reported in the *Southern Medical Journal* the case of a patient, 33 years of age, with congenital absence of the uterus, both tubes, and the right ovary.

H. R. Leland, Minneapolis, reporting in *Minnesota Medical Journal,* February, 1929, calls attention to a case of unilateral absence of the fallopian tube and ovary, and mentions a report by Eismayer of ten cases of unilateral absence of the fallopian tube and one bilateral, stating further that in this series one-half of the cases presented an absence of the corresponding kidney.

J. Herbert Sanders, of Hong Kong, reported in the *British Medical Journal,* June 22, 1928, a case of congenital absence of one fallopian tube and corresponding ovary.

R. E. Nowland, of Sydney, Australia, reported in 1929 a case of unilateral absence of fallopian tube and ovary.

Nicholas M. Sanctis and J. S. Diasio report a similar case in the *American Journal of Obstetrics and Gynecology.*

In 1930, Helen W. Spencer reported a case of absence of the tube which she had demonstrated by tubal insufflation.

H. Hauser, in 1911, reported a case of unilateral defect of the ovary with a corresponding rudimentary tube and a unilateral rudimentary ovary with a corresponding normal tube.

THE SOCIAL SIGNIFICANCE OF SYPHILIS.*

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There are many phases to be considered in estimating the extent of the problem of syphilis. I shall attempt to discuss them from three angles:

First: The frequency of its occurrence.

Second: The seriousness of the disease. The extent to which it disables and kills.

Third: The social implications. The extent to which one case endangers and burdens the lives of other individuals.

*Read before the Division on Public Health and Medical Care of the Virginia Conference of Social Work, at Roanoke, March 19, 1936.

1. THE FREQUENCY OF THE DISEASE.

Many surveys have been made in an attempt to determine the extent to which the general population is infected with syphilis.

There are two main methods used. One is to study the returns from questionnaires sent to physicians

and clinics treating cases. This estimates the number of cases which receive treatment. The other method involves the performance of serological tests, such as the Wassermann, on a group of unselected individuals with the determination of the percentage of positive reactions. The outstanding studies of the first type are the one-day surveys made by the United States Public Health Service.

According to the observations of the study reported in May, 1935,[1] there are constantly under treatment 4.3 cases of syphilis per 1,000 population in the United States. This has been termed the prevalence of the disease. The number of new infections occurring yearly was termed the incidence of the disease. This was found to be 4 per 1,000 population. From these figures it was estimated that there are at any one time 643,000 cases of syphilis under treatment in the United States and each year 518,000 new cases occur.

This study further showed that the prevalence in the colored population is about three to five times as high as in the white population and that the figures for the communities studied in the State of Virginia were comparable to those of the country as a whole. It must be kept in mind that these figures refer to cases under treatment. There are many victims who do not apply for medical treatment, who receive unorthodox care, or who do not even known they have contracted the disease. The figures, therefore, refer to a minimum estimate of the prevalence of the disease, and the comparison of communities by these figures probably compares the extent to which the cases of syphilis are under medical treatment. That is, a community that makes a definite effort to bring cases under treatment would have a high rate. This is especially suggested by the high figures of the prevalence in Charlottesville where the intensive work reported by Smith and Brumfield[2] in tracing down the sources of infection has attracted international recognition.

Comparing this survey reported in 1935 with previous surveys we find no evidence that syphilis is declining. On the contrary it appears that there has been an increase in the number of cases applying for treatment.

The second method of estimating the extent of the disease is the performance of routine Wassermann reactions on a group of unselected individuals. It is quite difficult to obtain a series of Wassermann reactions on a group of persons who would represent a cross section of the general population because of the tremendous influence played by the age, color, sex, and social status of the individuals of the group on the incidence of syphilis. However, to give you an idea of the results of these studies I will quote a few of the precentages of positive serological reactions in some of the groups studied:

.2 per cent of 5,000 college students.[3]

.33 per cent of 1,000 professional students.[4]

2.06 per cent of 3,000 routine dental patients.[5]

2.09 per cent of 11,000 Life Extension Institute examinations.[6]

2.64 per cent of 10,000 private hospital admissions in Richmond.[7]

Guldberg found that 5.8 per cent of over 8,000 autopsies showed evidences of infection.[8]

There have been several excellent serological studies made of the Negro population. The prevalence as determined by positive Wassermann reactions varied from about 10 per cent in Albemarle County, Virginia, to almost 40 per cent in Macon County, Alabama.[9] It is interesting to note the percentages of positive Wassermanns in different age groups. In a combined curve the prevalence reaches a peak in the group from thirty to thirty-four years of age and declines sharply over forty years of age. It is also noteworthy that about one in four colored women in the child-bearing period has a positive Wassermann.

Usilton[1] estimated the number of cases remaining as a potential treatment problem from the standpoint of syphilis at different ages by a statistical study based on the annual incidence rate of early syphilis corrected by subtracting the number of cases believed to receive adequate treatment and those believed to undergo a spontaneous cure. In this way she estimated a cumulative age curve showing the number of persons with syphilis who should be under medical care. The number increased with age, reaching 2 per cent at age twenty, 5 per cent at age thirty, and 7 per cent at age forty. If this estimation is correct, the number of syphilitics in the United States who should be under medical care would number in millions.

In Virginia the State Epidemiologist estimates that there are 125,000 cases who should be under treatment.[10]

2. PROGNOSIS.

Next I should like to discuss the extent to which syphilis disables or kills the individual. What

happens to an individual who is infected? How serious a thing is it?

The disease runs an interesting and complicated course—quite different from that of an acute infectious disease such as pneumonia. A brief summary of the course of the disease is as follows:[11]

Infection usually takes place by direct contact with a recently infected person. On an average of three weeks after the first infection there usually develops a small lesion at the site of contact—but during this time the organisms are spreading over the whole body.

After an average interval of six weeks following the appearance of the initial lesion there may appear a secondary outbreak which involves mainly the skin, mucous membranes, eyes, and nervous system. These early lesions are highly infectious and the disease is usually transmitted by contact while these exist.

These manifestations heal and the disease tends to become quiescent. This stage we term "latent syphilis." Practically the only sign of the disease is the presence of a positive serological reaction.

This quiescent stage may last from a few months to a lifetime, but it averages about seven years. It is after this stage that the disease reaches the serious stage, the stage which disables and kills its victims, by affecting mainly the heart, brain, and spinal cord.

You will want to know, at once, how many infected individuals develop these serious impairments without treatment and to what extent treatment will prevent them.

From an interesting study made in Norway[12] it has been estimated that of 100 persons contracting syphilis and remaining untreated—twenty-three will develop a late lesion which will incapacitate or kill, twelve will develop a more or less harmless late lesion and the remaining sixty-four will pass through life unharmed as far as they themselves are concerned.

Adequate treatment alters this outcome markedly. Its effect may be summarized by saying that during the early stage the patient has a 90 to 100 per cent chance of being cured but that after the serious late manifestations have developed very little can be accomplished except symptomatically.

Another indication of the seriousness of the disease is the experience the Life Insurance Companies have had in insuring lives of persons with syphilis. A study of 27,500 lives in 1913 showed the mortality was about 1.8 times the predicted,[13] while a study of about 100,000 lives in 1929 showed a mortality about 1.4 times the predicted.[14] The persons insured were all submitted to medical selection and were supposedly the most favorable applicants with the history of syphilis being the only impairment present.

The mortality rate obtained from compilation of death certificates is probably misleading because of the hesitancy in reporting a death as due to syphilis. The death rate as reported by the Bureau of Census was 11.6 per 100,000 population in 1900. It rose to 19.8 in 1917 and has been declining steadily since that time, reaching 13.7 in 1932.[15]

When we consider white and colored rates separately, we find that while there is occurring a definite decline in the death rate for whites there is apparently a rise in the rate for colored persons.[16]

In Virginia the death rate from syphilis is usually around 20 per 100,000 population. In 1934 it was 19.1. Taking the white and colored separately, we find that the white rate was 8.4 while the colored was 49.1.

3. SOCIAL IMPLICATIONS.

In the preceding description I have reviewed the course of the disease in order to emphasize certain social aspects of syphilis.

You will notice that the contagious period occurs early in the course of the disease. It is during this early stage that treatment must be given in an attempt to prevent its spread. It is the social duty of the individual during the infectious period to receive treatment and to take precautions necessary to prevent giving the disease to some one else. It is also the social duty of society in general to provide facilities whereby the individual may receive this necessary treatment, and to impress upon the individual the necessity for treatment and for continuing the treatment until an adequate amount has been administered.

Syphilis spreads chiefly in a series of small outbursts, the disease being passed on while it is in the early infectious stage. These outbursts, or epidemics, can be traced just as epidemics of typhoid fever are traced. Besides providing facilities for treatment of these early cases it is also necessary that the sources of their infection and their contacts be traced rapidly, so that these other persons also

may be treated as early as possible in the course of the disease.

During the early stages of syphilis, therefore, the medical social worker may be of great assistance in:

1. Impressing upon the patient the necessity for treatment.
2. Follow-up of the patient until adequate treatment is given.
3. Finding contacts and sources of infection.

Special note should be made of the importance of treating women infected with syphilis during pregnancy. The treatment of these cases should have great appeal not only because of the tremendous handicap to the child who enters life with this infection but also because of the excellent results which may be obtained if sufficient treatment is given during pregnancy.

The prevalence of syphilis in prenatal patients as determined by the percentage of positive Wassermanns has been found to vary from 2.5 to 19 per cent, depending on the race and social status of the group.[17]

Studies have shown that, if no treatment is given, about 50 per cent of the children will show evidence of congenital syphilis. If treatment is begun early enough during pregnancy and if sufficient treatment is given there will be almost no cases of congenital syphilis in the offspring.[19] If less than sufficient treatment is administered the results will be roughly proportional to the amount given.

In spite of the existence of this knowledge, about 2 per cent of children born today reveal evidence of congenital syphilis.

In addition to this, syphilis plays a large role in the causation of abortions and stillbirths. There are over 2,400 stillbirths in Virginia yearly.[20] It is thought that syphilis is probably the largest single cause of fetal mortality.[21]

It is imperative, therefore, that women during pregnancy should have a blood test made and, if this is positive, they should receive treatment regardless of previous treatments received or of the lack of clinical evidence of activity of the disease.

During the later period of the course of the disease the emphasis from a social viewpoint changes. Here syphilis damages society by disabling and killing persons who should be at the height of their responsibility and production. From 8 to 12 per cent of the inmates of insane hospitals are insane because of syphilis.[22-23] There are many other disabled individuals with heart disease and blindness caused by this disease. One authority estimated that the institutional care of cases of insanity due to syphilis costs $467,000,000 a year.[18] If we should add to this the cost of all syphilitic treatments and the loss of income due to disability and shortened span of life, we should really have a tremendous figure.

It was found in a limited group that the average age at infection was about twenty-nine years and that the average age at death was 45.8 years.[24] The statistics compiled by the Census Bureau show that the highest number of deaths from syphilis falls in the age group from forty-five to fifty-four years.[15] This is evidence that the disease prematurely kills its victim at a time when his family responsibility is great, when his children are in the formative years and need the security afforded by healthy parents and a stable home life.

The effects of public health endeavors in the past have not tended to allow old persons to live longer but have definitely allowed more people to live to old age. From the standpoint of social security this trend, which enables the family unit to remain intact until the children are self-supporting, is of utmost importance.

The reduction in the death rate in recent years has been due almost entirely to reduction in deaths caused by infectious diseases and to improved infant mortality. Attempts to defer the age at death from the degenerative diseases have been discouraging.

If we take this lesson from the past and continue to exert major effort in attacking disease which disables and kills prematurely and concerning the prevention of which we have known weapons, we find that the problem of syphilis offers a promising field, possibly the most promising field for further removing the burden of disease as an economic and social menace.

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XUM

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PRACTICAL MEASURES FOR DETECTING CASES OF SYPHILIS.*

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Syphilis is a disease to which all subdivisions of the human race are susceptible. It is supposed to have been brought to Europe in the latter part of the 15th century. Today there is probably no race on the face of the earth in which it is not prevalent. It is only in the last few decades that adequate methods for detection and treatment have been discovered.

The purpose of this paper is to briefly discuss the practical measures that are today of value in the control of syphilis. It is a specific infection that is caused by the organism known as the Treponema pallidum. It is contracted from the discharges of lesions or sores of the skin and mucous membranes, or from articles that have been freshly soiled by these discharges.

Its mode of transmission is either direct or indirect. Direct includes sexual intercourse and other forms of personal contact with the discharges containing the organism. It is also the one in which the germ is transmitted before childbirth, through the placenta and results in a congenital syphilitic child. The indirect method is that one in which the organism is transmitted from one individual to another by means of some intermediary host as a towel or drinking utensil.

The importance of syphilis as a cause of death is underestimated in this country. The main reason for this is the fact that many doctors are very reluctant to write such a name on the death certificate for fear of embarrassing the family. It is generally considered that syphilis ranks above both pneumonia and tuberculosis as a cause of death. When one studies the statistics in regard to the prevalence of the disease in this country it is easy to see that the efforts for its control are not wasted. The U. S. Public Health Service estimates that 518,000 new cases of early syphilis seek treatment annually. A recent survey made in six counties of various Southern States showed that a little over 20 per cent of the Negroes were infected. It varied in different localities.

The diagnosis of early syphilis is largely a laboratory procedure. This is true because of the high degree of accuracy of the methods that are available. Any state or community which hopes to successfully control the spread of this disease must provide facilities for a quick and accurate diagnosis in those people who are unable to secure a private physician. It is also necessary that the physician who is unable to do this properly have some place to which he can go for a consultation. The dark field examination in which some of the discharge from the lesion is examined under a special microscope is the procedure of choice in the first stage of the disease. Because of the expense and experience required in its use this is not practical for all physicians. The Public Health Department of New York State is now one of the few which provides laboratories to which any doctor

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can collect the serum from the syphilitic lesion and mail it in for dark field study. A laboratory must also be available so that a Wassermann and other serological tests can be made, both for diagnosis and as a guide in treatment.

If the practicing physician employed the Wassermann and other serological examinations along with his routine medical studies, a larger number of undiagnosed cases could be brought under treatment. There are facilities in this State to have these tests made free of charge. The public at large should also be educated to the fact that it is desirable for everyone to have routine Wassermanns made. It is also possible to make these tests for syphilis on certain groups of individuals.

It follows within reason that for every case of syphilis there is at least one other somewhere from whom the infection has been contracted, and possibly more to whom it has been passed on.

It is possible to obtain the names and addresses of the exposed sexual partners from the infected individual. One's ability to do this does not require any special degree of training, but can be done by any medical man with the understanding that the information is confidential. Once the name and address of the exposed contact has been obtained it is possible either by letter or by message through the patient himself, or by letter to the contact's physician, to have an examination made and treatment started if necessary.

It is also often necessary to search for an individual's contacts other than those that are sexual. All members of any household must have fairly personal contact with other members. A contagious syphilitic parent should certainly have the children examined because syphilis can be acquired other than through sexual intercourse. As often happens, either one or the other of the marital partners may have acquired the disease previous to marriage and passed it on to the other since. It is also obvious that a follow-up of either parent should be made for congenital syphilis among the children.

Any methods for prevention must be directed at that stage when the disease is the most contagious. This is generally considered to be within the first two years of the infection. It is during this time that both the primary and secondary stages occur. This is also the time to immediately start treatment. Adequate treatment is the chief weapon in preventing the spread of syphilis. It is fortunate that there is a drug available which will render a patient noncontagious quicker than in any other communicable disease. In a comparatively short time after the commencement of treatment with intravenous arsphenamine (606) the patient is no longer infectious. It is, however, necessary to give adequate continuous treatment if a cure is to be hoped for. Unless this is done it is possible that a relapse might occur which is also a contagious stage. One of the first prerequisites in the attempt to bring about the most desirable result is the patient's cooperation. If the doctors, nurses and social workers who come in contact with syphilitic individuals lead them to believe that they are immoral or social outcasts this cannot be hoped for. These people are sick just as are those with tuberculosis, typhoid fever, cancer, or any other disease, and should be respected accordingly.

There is probably no parallel in all medicine where such satisfactory preventive and therapeutic medicine can be practiced with such little effort as in treating the syphilitic pregnant woman. If treatment is started early enough in pregnancy a nonsyphilitic child can be practically assured. Also while the disease is being prevented in the offspring, progress towards a cure is being made in the mother.

Any child born of a syphilitic mother must have early and proper examinations in regard to either proving or disproving the presence of congenital syphilis. It is generally believed that if the diagnosis is made under six months of age the child will have an 85 per cent chance of both a serological and clinical cure if as many as fifty treatments are given before the child is two years old. However, it still remains that the best cure of congenital syphilis is proper prenatal care of the pregnant woman. If this is done the diagnosis can be made soon enough in the mother to prevent it in the offspring.

The practical medical methods that are available for detecting cases of syphilis are often hindered and indeed sometimes prevented because of the ignorance of the public at large The facts needed for the eradication of this disease are known. It can be prevented. There are means to accurately diagnose it in its early stages, and there is a drug which can cure it. As Stokes says, the only thing that remains is the education of the public.

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SYPHILIS AND GONORRHEA AS A MAJOR PUBLIC HEALTH PROBLEM.*

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While syphilis and gonorrhea have been known to the medical profession for many years, their importance to public health has been appreciated only in the past two decades since this important movement has gained impetus. Early sporadic attempts were made to control the dissemination of these diseases. Many of the early measures were directed chiefly toward the abolition of prostitution and general improvement in public morals. In the 15th century, for instance, the town council of one of the cities of Scotland decreed that all such persons desist from their vice and work for their support lest they be branded and banished from the town.

At the present time commercialized prostitution has been legally abolished in all English speaking countries. On the other hand, attainment of the ideal of suppression of clandestine prostitution and promiscuity through legal means has failed. Present measures for the prevention of syphilis and gonorrhea, therefore, pertain chiefly to the practical application of the modern scientific principles of public health. The insidious character of these diseases, their widespread prevalence, and the relatively high cost of a program aimed at their control have unjustifiably led to a pessimistic feeling among health officers with the result that comprehensive programs have not been adopted in most areas. Health officers have clung to the belief, so deeply ingrained, that more progress could be made in public health by applying the limited available personnel and the restricted funds to the control of the more acute communicable diseases. The marked success which has been attained during the last few decades in the control of the acute communicable diseases has eliminated many of them as serious problems. The time has arrived, therefore, when health organizations will devote more of their resources to the control of syphilis and gonorrhea.

*Read before the Division on Public Health and Medical Care of the Virginia Conference of Social Work at Roanoke, March 19, 1936.

PREVALENCE

Morbidity and mortality reports are as unreliable an indication of the prevalence of syphilis and gonorrhea as of any of the communicable diseases. This fact has been known for many years. A large number of studies have been made of the prevalence and incidence of syphilis. Many of these were confined to selected population groups and few have yielded information which is generally considered to be reliable.

In 1928 the health authorities in Germany described a method of establishing the prevalence of syphilis and gonorrhea by utilizing surveys of sources of treatment. A few years later the Public Health Service began a series of surveys of sources of treatment for syphilis and gonorrhea in this country. Up to the present time surveys have been completed in forty-nine representative communities throughout the United States in cooperation with State and local health departments and the American Social Hygiene Association. Twenty-nine million of the Nation's population or approximately one-fourth of the citizens of the country live in these surveyed areas.

In conducting the surveys, sources of treatment were requested to report the number of cases of syphilis and gonorrhea seeking medical care during a given period. Further data pertaining to the chronicity of the infections and the duration of the treatment-observation periods were likewise requested. Practically 100 per cent of the questionnaires submitted to the sources of treatment during these surveys were returned.

As a result of this work it has been possible to establish the prevalence rate for cases of syphilis under treatment at any one time throughout the United States at 5.2 per 1,000 for the male population and 3.4 per 1,000 for the female population. For gonorrhea the rate is 4.9 per 1,000 male population and 1.8 per 1,000 female population. The total prevalence rate of syphilis and gonorrhea for both sexes is 7.7 per 1,000 population. In thirty-eight communities additional data were available

with regard to the race of the patients. The rate for Negroes infected with syphilis was 8.4 per 1,000 Negro population and for gonorrhea 3.4 per 1,000 Negro population. The rates in the thirty-eight communities for the white population were 4.5 per 1,000 population for syphilis and 4.0 per 1,000 population for gonorrhea.

The annual incidence of syphilis and gonorrhea for the entire country has been estimated from these surveys. Considering only the early cases of syphilis and the acute cases of gonorrhea, it has been computed that 518,000 new cases of syphilis and 1,037,000 new cases of acute gonorrhea annually seek treatment in the United States. The total number of new venereal infections each year exceeds one and one-half million cases.

A consideration of the prevalence of syphilis and gonorrhea in the State of Virginia should be of interest. Eight years ago a survey of all sources of treatment in eighteen counties was made by the Public Health Service in cooperation with the State Health Department and the local medical profession. The data which were accumulated permit the prevalence of syphilis and gonorrhea to be established for the whole State. The evidence indicates that 10,200 cases of syphilis and 8,000 cases of gonorrhea are constantly under treatment in the State of Virginia. Data were not accumulated during this survey which permit a reliable estimate of incidence.

It has already been noted that morbidity reports submitted by health departments are generally regarded as incomplete evidence of the incidence of syphilis and gonorrhea. Reports which were submitted to the Public Health Service by the Virginia State Health Department in 1928 included only 2,004 new cases of syphilis and gonorrhea. In the calendar year 1935, however, 8,396 cases of these two diseases were reported. It is improbable that these figures portray an actual increase. Rather they seem to suggest an increased interest among physicians engaged in private practice. In the year 1928 only 11 per cent of the morbidity reports received by the State Health Department were from physicians, whereas in 1935 private physicians reported 74 per cent of the cases. This represents an increase of almost 3,000 per cent in the number of reports submitted by physicians during the seven-year period. Such an increase would not have been shown had the physicians of the State not been interested in the venereal disease problem. It is believed that those primarily responsible for the development of a more comprehensive program directed against syphilis and gonorrhea in the State of Virginia would do well to consider this evidence thoroughly in planning the future health program for the State.

A comparison of the rates for syphilis and gonorrhea with those of other common communicable diseases is of great interest. In the year 1935, 202 new cases of syphilis and 141 new cases of gonorrhea were reported to the Virginia State Health Department per 100,000 population. Rates per 100,000 population for other communicable diseases are not available for 1935, but those for 1934 are presented below:

Communicable Diseases	*Rates per* 100,000 *population*
Scarlet fever	124
Tuberculosis, pulmonary	159
Diphtheria	81
Typhoid and paratyphoid	32
Poliomyelitis	3
Smallpox	1

It is to be noted that syphilis occurs 50 per cent more frequently than does scarlet fever and almost seven times as often as typhoid and paratyphoid fevers combined. Syphilis occurs 30 per cent more frequently than tuberculosis. In view of this consider the expenditures by the State Health Department for the control of these two diseases in comparison with the relative effectiveness of present-day treatment from a public health standpoint. An allocation of funds on the basis of the prevalence of communicable diseases may not be a method which is entirely justifiable, yet adequate provision for a comprehensive program to control syphilis is a basic principle in the organization of every efficient health department.

THE APPLICATION OF CONTROL MEASURES

Anyone unfamiliar with the technical significance of these high prevalence and incidence rates can appreciate the vast importance of these two diseases to the social and economic welfare of the Nation. Despite the manifest seriousness of the problem due importance has not been given to the control of the venereal diseases by health departments generally. Neglect of the problem is due particularly to the failure of the civil population to demand the institution of a comprehensive program.

The time is now rapidly approaching when health

departments will not be permitted by an aroused public longer to neglect the control of syphilis and gonorrhea. Under the authority of the recently enacted Federal Social Security legislation funds are available to State and local health departments which may be applied to the control of these diseases. Appreciating the opportunity which is offered as the result of this new legislation, the Surgeon General appointed an Advisory Committee to recommend a venereal disease control program for application in State and local health departments. In formulating its recommendations the Advisory Committee described plans for control work which were not only far-reaching and complete but were purposely of a general character. The recommendation of general measures only was necessary in order that the program might be adaptable to the varying conditions in the several states.

In the general administration of the venereal disease control program the Advisory Committee recommended that such work should be integrated or performed in close liaison with the communicable disease division of the health department. At the same time it was felt that venereal disease control work should be conducted either under a separate division or subdivision with a high degree of autonomy. The direction of the program by a full-time venereal disease control officer was considered necessary and no exception to this rule should be permitted in the health department of any state or large city. A third important problem in the administration of the program was that of the provision of adequate funds. Two fundamental principles should be observed in determining the proportion of funds to be allocated to venereal disease control activities. First, there should be a carefully drawn State program to secure for the public adequate protection against the spread of disease by infected individuals, and for the individual patient adequate treatment, skilled medical care, and maximum privacy. Second, the allocation of funds should be considered on the basis of the relative prevalence of the venereal diseases in proportion to all communicable diseases in the State's morbidity rates. For the entire United States the venereal diseases represent approximately 20 per cent of all communicable diseases reported. Few health departments have followed in the past a policy of financing venereal disease control activities based upon either of these two principles.

ADEQUATE TREATMENT FACILITIES

In the present state of our knowledge the control of the venereal diseases is primarily dependent upon the correct clinical management of early cases. No health program for the control of syphilis and gonorrhea can succeed unless the newly infected cases be given proper care. Appreciating this point, the Advisory Committee made recommendations for the development of treatment facilities in both urban and rural communities.

The establishment of new clinics or other institutions for treatment of syphilis and gonorrhea would not be justified in many parts of the country because excellent private facilities already exist. Private institutions have been handicapped frequently by inadequate financial support, and the reference of large numbers of patients for admission who constitute grave hazards to the public health. For this reason, it was recommended that existing clinics and other sources of treatment, if they are able to conform with minimum standards of efficiency be subsidized by health departments in their respective areas. Polyclinics seem preferable to isolated clinics because in such clinics the reason for the patient's admission is unknown, because there are specialists in other lines of work for consultation, and also because in-patient treatment is available in most polyclinics if this becomes necessary.

In rural areas it was recommended that adequate treatment be achieved by extending subventionary assistance to properly qualified local physicians or by the provision of treatment to indigent patients by county health officers themselves, provided these officers have had proper training in the clinical management of such cases.

The principle of free distribution of antisyphilitic drugs to all sources of treatment regardless of the patient's ability to pay was approved. Where financial conditions permit the recommendation was made that not only should routine diagnostic laboratory services be made generally available, but that at least one approved venereal disease diagnostic and treatment center be made available in each state. In such centers roentgenologic and special laboratory facilities should be provided for indigent citizens or those who because of limited financial means could not meet the regular fees of specialists for such services. In addition to this ambulatory consultant service, the diagnostic and treatment center

should also provide for the hospitalization of indigent patients whose illness requires in-patient care.

WHAT TREATMENT ACCOMPLISHES

The practical accomplishments of treatment in the public health control of syphilis can best be shown by citing certain findings of the cooperative clinical group of the Public Health Service. If therapy is started during the first year of the syphilitic infection and continued until adequate, the patient may expect results equivalent to cure in three out of four cases. As here used, the term adequate treatment means the administration by the continuous alternating method of at least thirty-two doses each of one of the arsphenamines and of one of the bismuth preparations over a period of approximately eighteen months. The real opportunity for the prevention of the transmission of syphilis also exists in the treatment of early cases. The cooperative clinical studies have shown that when adequate treatment is given communicable forms of relapse are prevented in practically all cases. As is well known, the administration of antisyphilitic treatment terminates immediately the course of communicable lesions which were present before treatment was started.

The physician has an opportunity to prevent the transmission of syphilis from the pregnant woman to her unborn child which almost equals the prevention of the transmission of the acquired infection in the early stage of this disease. It has been demonstrated that if treatment is started before the fifth month of pregnancy, is continued until the end of term, and consists of a minimum of ten doses of one of the arsphenamines and accompanying heavy metal, the transmission of the disease to the fetus can be prevented in nine out of ten cases.

From the public health standpoint, therefore, the golden opportunity for the prevention of the transmission of syphilis exists during the early stage of the disease and during pregnancy.

Unfortunately, present knowledge of the clinical management of gonorrhea does not permit the standardization of therapeutic procedure. It is well known, however, that most properly managed cases of gonorrhea run, on an average, a course which is relatively benign and that recovery results within two to three months. The need for insistence upon the application of treatment for gonorrhea by physicians who are thoroughly experienced in this line of work is also well known. The treatment of cases by improperly trained physicians is not only useless but may be productive of considerable harm both from the standpoint of the public health and the individual.

THE APPLICATION OF EPIDEMIOLOGIC PROCEDURE

The application of fundamental principles to the study of the transmission of syphilis has only been made in recent years. It was initiated by the pioneer work of Munson in New York State. In later years others have become interested in the problem and the principle of epidemiologic investigation in venereal disease control work is accepted by modern health organizations. Some of the most recent observations indicate that from a practical standpoint the danger period for the transmission of acquired syphilis is almost entirely limited to the first year of the disease. The great importance of early syphilis in the control picture may be appreciated when it is realized that all authorities are now of the opinion that the first five years of the syphilitic infection constitute the only period during which acquired syphilis is ordinarily transmitted.

All workers in the venereal disease control program should insist upon detailed epidemiologic study of every early case of syphilis and gonorrhea. The epidemiologic work should be conducted either by the physician in charge of the case or under the supervision of the venereal disease control officer by thoroughly experienced medical follow-up workers. These workers should be charged with two duties, each equally important: First, the epidemiologic investigation of the early case with the object of bringing such cases to treatment, and contacts with such cases to examination and treatment if necessary. Second, the follow-up of patients, lapsed from treatment, especially those with infectious lesions. In no other phase of the application of epidemiologic methods is such tact and understanding required of the follow-up worker. Not only may the epidemiologic investigation arouse the distrust and ire of the patient but a worker with lack of training or understanding may cause serious familial or social complications. The medical follow-up worker for such investigations should, therefore, be appointed on the basis of real merit and experience and not because of spurious claims of ability or through political coercion.

XUM

THE INFORMATIVE AND EDUCATIONAL PROGRAM

This part of the venereal disease control program should be prosecuted to the fullest extent of the health department's capacity. Its importance cannot be denied. Intelligent application of modern communicative methods should make it possible to give to every citizen concise and pertinent information relating to the prevalence and serious character of the venereal diseases. Every citizen should also know where treatment may be obtained, should he be unable to meet the cost of adequate medical care. The importance of public support of the program must be repeatedly emphasized by prominent interested citizens since funds will only be made available by legislators because of insistent demand.

Medical schools should be encouraged by both private physicians and health officers to revise their curricula when necessary in order to place before all students the fundamental principles of the control of syphilis and gonorrhea. In such schools the proper management of early syphilis and syphilis in pregnancy should be particularly emphasized. With the cooperation of State boards of medical examiners the inclusion of congruous information in the medical curriculum can be made compulsory. Such boards of examiners could do much to attain this end by requiring that at least one question pertinent to the public health control of these diseases be included in all examinations on clinical subjects.

A solution of the problem cannot be brought about without the assistance of physicians in private practice. Admitting this concept to be a fundamental principle, all interested health departments and voluntary agencies should seek the aid of medical societies in inaugurating a comprehensive and enduring plan for informative work among private physicians. The final goal will not be attained until every physician in private practice understands and supports the basic points in the control program.

THE RESULTS OF A COMPREHENSIVE PROGRAM

The critical observer will ask what may be expected from the adoption of such a complex program. Even under favorable conditions may we expect syphilis to be brought under control? This question is best answered by reference to certain articles which have appeared in the literature in recent years. Two years ago Harrison, as the result of the application of the venereal disease treatment scheme in England and Wales, inaugurated in 1916, reported a material decrease in the incidence of early syphilis in those two countries. This worker also noted that the death rate among infants due to congenital syphilis was reduced to approximately one-third of the original figure within two decades. The marked success attained in the smaller European countries, especially Denmark and Sweden, is a matter of common knowledge.

It might be said that perhaps conditions in the countries of Europe differ from those in the United States to such an extent that while success can be attained in foreign lands but little or no progress may be expected in this country. A recent report by Nelson belies such a conclusion. This health officer has been able to show a decrease in the incidence of early syphilis in the State of Massachusetts which is quite comparable with that in England and Wales. He has also discovered that in institutions rendering prenatal care and in which serologic tests for syphilis have long been routine procedure, the percentage of positive and doubtful reports in pregnant women has decreased from 9.9 during the period from 1915 to 1919 to 2.1 in 1934. This same observer has noted a decrease in the prevalence of neurosyphilis in Massachusetts of 32.3 per cent in 1934 over the year 1930.

The health departments in the areas in which this progress has been made perhaps do not face other serious hazards such as those in many less fortunate states and countries. This fact, however, does not detract from the splendid results which have been attained and the individuals responsible for success deserve all possible credit. Their accomplishments should serve as a source of inspiration to other health departments and as a stimulus to the inauguration of more effective measures generally in the United States.

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AIR EMBOLISM AND PLEURAL SHOCK.*

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Catawba Sanatorium, Va.

By air embolism is meant the plugging of a vein or artery by bubbles of air. Beauchse reported a case in 1818 following the removal of a tumor from the neck of one of his patients. Since then this accident is not an infrequent finding in the surgical field. Yearly reports reveal tragedies following thyroidectomies, irrigations of the maxillary sinuses and empyema cavities, fractures of the long bones, infusions and transfusions. Gough reports a case in which the patient died of air embolism following an apparently normal delivery. Occurring as often as it does in the above and other sundry fields by far the greatest number of cases of air embolism are seen during the administration of air in artificial pneumothorax.

Fortunately, in the treatment of tuberculosis, air embolism does not occur frequently, but it is the most dangerous complication and often is fatal. Most authors reporting these cases claim one can expect the accident in one to two thousand refills, with percentage of mortality ranging from 15 per cent to 50 per cent. Five of Reefer and Kohl's ten patients died and two of Hamilton and Rothstein's nine. Luckily, at this institution we can report only two serious cases—one fatal—in more than 36,000 refills.

It is difficult to explain the anatomical routes by which the emboli reach the cerebral and coronary vessels. As a working hypothesis, Hamilton and Rothstein suggest these cases may be divided into those in which it gains entrance into the peripheral venous system and those in which it enters the pulmonary venous circuit.

Perhaps you would like a review of the circulatory system, in which the source of these traumatic accidents may occur. You have before you a diagram of the thoracic circulatory system. You can see that the intercostal veins drain the blood from the intercostal spaces. The highest intercostal veins receive the blood from the upper four intercostal spaces. On the left they flow into accessory hemiazygos or the left innominate vein and on the right the intercostals flow into the azygos which, in turn, empties into the superior vena cava. The lower left intercostal veins are tributaries of the hemiazygos. The blood continues through the right heart and pulmonary arteries to the lungs. Here it divides into branches running parallel to the bronchial tubes and ends in a dense network of small capillaries in the walls of the alveoli. These capillaries continue with the pulmonary capillaries, coalesce, and after communicating with other branches finally reach the left auricle by the four pulmonary veins. The bronchial arteries, branches of the thoracic aorta, supply the lung tissue with nutrition. They accompany the bronchial tubes and form a capillary plexus in the muscular coat. The plexus communicates with venous channels which empty into the azygos or hemiazygos veins. With this picture of the circulatory system in mind, what are the essential factors necessary in producing air embolism?

The first important prerequisite is a diseased lung or pleura. Hamilton points out that the normal lung is elastic and that the visceral pleura of the lung tends to be forced away by the surgical needle, and the vessels tend to collapse or retract when punctured. But when a lung is diseased, whether it be by tuberculosis, pneumonia, abscess formation, syphilis, silicosis, or some other type of infection, the diseased parts hold the vessels stationary, preventing their retraction and collapse and permitting perforation by the pneumothorax or aspirating needle.

Another important essential concerns the pulmonary venous pressure. This pressure, on inspiration, is less than atmospheric pressure; and when a bronchus is partially obstructed by a tuberculous process, this negative pressure is greatly increased—especially on forced inspiration. During this time the peripheral venous vessels may grossly dilate, especially near the termination of the inspiratory act. If a needle is introduced into one of these and air is permitted to flow from the pneumothorax apparatus, it would be relatively easy for an air embolism to result.

*Read before the Roanoke Academy of Medicine at a meeting held at Catawba Sanatorium, Va., April 20, 1936.

Moreover, if small walled-off pockets have been formed between the layers of pleura when a lung is adherent to the parietal pleura as a result of disease or injury, and if air is injected under pressure into one of these pockets, it may enter a damaged vessel. This is particularly likely to occur if the pressure is greatly increased as a result of the closing of the glottis during expiration and coughing.

Brandes quotes a case in which cerebral embolism resulted from the injection of bismuth paste into an empyema fistula. Particles of the paste were removed from the cerebral vessels at postmortem.

I wish to present for your consideration this thought: those of you who have given pneumothorax realize that, if a pneumothorax needle is introduced into the subcutaneous tissues of the chest and forced down to the parietal pleura, but not into the pleural cavity, a negative pressure will be recorded on the manometer. Although this oscillation is generally narrow between the points of fluctuation, it is often most difficult to distinguish the position of the needle point—especially when pleural adhesions partially obliterate the pleural space. If an intercostal vein is injured or perforated or the inflamed vessels of the parietal pleura are damaged, is it not possible to introduce air by this route?

Suffice it to say that the quantity of air necessary to produce an embolism is variable. Weaver found he could produce the condition in his experimental animals by injecting as little as one c.c. of air into the carotid artery. Norland found it was often necessary to inject 160 c.c. of more into the peripheral system before clinical signs of embolism were observed.

Air may reach the vascular system from one of several sources: (1) It may be introduced from the air chambers of the pneumothorax apparatus. (2) It may be aspirated from the pleural space, especially if a positive pressure is present and the pleural vessels have been traumatized. (3) it may be aspirated from the tubing and needle. (4) As Dr. Everett Watson suggested, it may result from the aspiration of air from a small bronchus, the bevel of the needle connecting the vessel and bronchus. (5) It may be sucked from a cavity during coughing attacks, if the vessels of the cavity are injured or perforated as a result of erosion or hemorrhage.

The clinical symptoms depend largely on the part of the body receiving the foreign substance—the air embolus. In most cases the patient complains of giddiness, feeling queer, faint, tickling of the throat, or he may cough up some frothy blood and lapse into coma or convulsions. The pupils are dilated. Splotching of the skin is not an infrequent finding. Transient blindness, diplopia, nystagmus, and vertigo are not unusual. Sudden death is not rare. Cyanosis, marbling of the skin, shock, profuse, perspiration, chills, cardiac irregularity, and respiratory failure may complete the picture.

Contrary to some textbooks, the diagnosis of air embolism, as a complication of artificial pneumothorax, is often a difficult problem. It may be impossible to differentiate the accident from apoplexy occurring simultaneously with the pneumothorax refill. A history of a pre-existing B. P. elevation, cardiac disease, and previous attacks of fainting help in the differential diagnosis. Fainting and nervousness, especially among women, are frequent conditions during the administration of pneumothorax. Spontaneous pneumothorax, rupture of an aortic aneurysm, and puncture of the cardiac muscle should be ruled out.

As for pleural shock, I doubt if it occurs. Weaver claimed small amounts of air injected into the vascular system of his experimental dogs gave signs of the so-called pleural shock, and larger doses showed signs simulating air embolism.

Pathology. If the patient dies of the initial attack and an autopsy is performed at once, air may be found in the coronary, retinal, cerebral and pulmonary vessels, and also in the capillaries of the lungs. In the experimental animals the right heart and pulmonary arteries and its branches are filled with air bubbles. If the air is introduced into a vein, other than a pulmonary vein, it must pass through the capillaries of the lungs, or it may pass through a patent foramen ovale and then into the arterial system. At times no cause of death is found at the autopsy table. Electrocardiographic tracings were made on Durants' patient before and after the coronary air embolism. An inversion of the T-wave and other signs of the coronary accident were demonstrated. After thirteen months the T-waves were normal.

If air enters one of the cerebral arteries and is not

XUM

readily absorbed, infarction of the brain is inevitable. Softening and liquefaction follow.

CASE REPORTS

Case 1.—This patient is a white man, age 52, a coal miner for the past twenty years, who was admitted to Catawba Sanatorium, August 21, 1935, with a complaint of cough and expectoration for the past eighteen months.

The family history is essentially negative. There is no history of tuberculosis.

He gives a history of G. C., age 19, with good recovery. He had a severe attack of influenza in 1918. Fistula in ano for past fifteen years. The patient claims he enjoyed very good health until the fall of 1933, at which time he began losing weight and strength, and complained of a chronic cold with a persistent cough. He lost twenty-five pounds during the fall of 1933 and spring of 1934. Throughout the year of 1934, his symptoms grew progressively worse and in January, 1935, he had a small hemorrhage, followed by "streaks" for sometime. He continued working until July, when he had another hemorrhage of about two ounces. The sputum was examined and reported positive for tubercle bacilli.

On physical examination one finds a fairly well-nourished, alert, and cooperative man who does not appear acutely ill. All teeth were missing except three which showed evidence of pyorrhea. The throat was negative. Physical examination of the chest revealed evidence of far advanced, active, fibro-caseous tuberculosis, confined mainly to the apex of the right lung. The X-ray confirmed these findings. The laboratory findings on admission were as follows: Positive sputum, 7,300 leucocytes, with 73 per cent P. M. N.'s, 17 per cent small lymphocytes, 4 per cent eosinophils, and 6 per cent transitionals. Negative Wassermann. The urine examination showed 30 pus to h.p.f.

On the twelfth of September artificial pneumothorax was begun. The field of operation was prepared in the usual manner. The skin and subcutaneous tissues and parietal pleura were infiltrated with 1 per cent solution of novocain. The pneumothorax needle, a Fischer, was then introduced into the pleural space with some difficulty, and 150 c.c. of air given very slowly. The open pressure reading on the manometer registered — 1 + 2, and the closing reading was + 1 + 5. Again, on the sixteenth, we gave the patient 150 c.c. of air. This time, as previously, the patient complained of a little pain during and after the injection of air. Fluoroscopic examination showed very little evidence of collapse, and it was thought wise to perform a phrenicotomy on the right side, which was done on the seventeenth of September. The phrenic nerve was found in the usual position and crushed with a hemostat. No accessory nerve was found. Fluoroscopic examination a few days later showed elevation and immobility of the diaphragm. Due to the infiltration in the middle third, we attempted to continue his pneumothorax. One hundred c.c. of gas was given on the twenty-third and 225 c.c. on the twenty-sixth of September. The final reading on the last date was — 2 + 0. On the thirtieth, the patient claimed he was feeling unusually well. There was less cough and expectoration. He was placed on the operating table for pneumothorax. For some reason the pleural space was hard to find and two or three attempts were made before a reading of 0 + 2 was recorded. The nurse was instructed to open and close the circuit. We make a habit of talking to the patient while he is getting a refill, so that any accident may be detected, especially one who has an unsatisfactory collapse. The circuit was opened, and before 25 c.c. of air could be introduced the patient suddenly ceased talking and collapsed. The needle was immediately withdrawn. No blood was seen on the needle. The head was lowered and 1 c.c. of adrenalin and 7½ grs. of caffein sodium benzoate were given by hypodermic. The respiration was very slow and shallow; the heart was distant and irregular; lips and fingers became cyanotic and the skin cold and clammy. Splotching of the body, especially the right side, was a prominent feature. B. P. after about ten minutes from the time the accident occurred was 85/60. The left leg and arm were flaccid but there was some movement of the right arm and leg. After one hour the following signs appeared: The patient responded to questions but answered in monosyllables. He was in no pain, no deviation of the tongue from the midline; left side of face partially paralyzed and free of pain when stuck with pin; knee jerk hyperactive on left. Three hours later pulse strong, respiration slow but regular; circulation greatly improved; only slight cyanosis. As the evening approached he became unconscious and there was severe jerking of the head and

XUM

upper left arm. B. P. at 9 P. M. was 120/90. Five hundred c.c.'s of normal saline were given by rectum, and at 10:15 P. M. 3 grains of amytal were given by rectum. The patient was restless, so at 11:30 P. M. 1/6 of morphine sulphate and 1/150 of atropine sulphate were given. After lowering the foot of bed, the patient became quiet. He was treated symptomatically. October 2nd, at 10:10 A. M., he had a chill followed by shock and intense cyanosis; relieved by adrenalin and caffein sodium benzoate. After a short time he improved and complained of occipital headache. On the fifth day, he complained of severe pain in his left chest. He was seen by Dr. Spessard, of Roanoke, who confirmed our diagnosis and suggested treatment. X-ray findings showed elevation of diaphragm and a little pneumothorax in right axilla. There was a wide daily fluctuation of his temperature, ranging from 98 at 7 A. M. to 102.6 at 7 P. M. November 2nd, a sedimentation test was done with an index of twenty-seven minutes, which pointed to a bad prognosis. Definite mental changes. Patient became irrational and disorientated as to time and place. Uncooperative. November 21st, he developed a severe cough, pain in left chest, with changes in breath sounds and moist râles over front and back of lower chest. Leucocyte count 22,500, with 87 per cent P. M. N. Condition became progressively worse, and on November 30th he expired.

Permission for an examination of the brain was obtained. The findings were as follows: Destruction of internal capsule and liquefaction of the posterior portion of the cerebral hemisphere on right side.

Case 2.—A white woman, age 28, admitted to Catawba Sanatorium, March 19, 1928, with a diagnosis of far advanced pulmonary tuberculosis confined mainly to the right apex. August 27, 1929, artificial pneumothorax was begun on the right. The opening pressure was — 2 + 0. Only 75 c.c.'s of air were given and the closing pressure reading was — 6 + 12. She received small quantities of air bi-weekly. On the twentieth of September a refill was attempted with the following results: I shall read Dr. Garst's notes taken at that time: "Pneumothorax discontinued, due to reaction to operation. While on the table and just after the introduction of air into the pleural cavity, patient complained of "feeling funny," and fainted. This was followed by a right-sided convulsion, splotching of the skin on right side, and a swelling of the right half of the lips. Vomiting occurred but there was no involuntary voiding. Pneumothorax discontinued. The patient was restless and irrational for about sixty hours. During this time she was not conscious of her surroundings, nor did she recognize her husband or attendant."

On the fifth of October, Dr. Broome reported the patient was afraid to stay alone and had some visual disturbances. On the twenty-fourth of October, Dr. Garst reported: "The patient has not become perfectly normal but is improved." Nervousness gradually disappeared and the patient was discharged on October 4, 1931. Dr. Nicholls' X-ray report at this time, compared with the original report, was as follows: "When compared with 2-5-31 no very marked change. When compared with the original plates there has been definite improvement in both lungs, chiefly the upper right."

On March 31, 1933, Dr. Garst received a letter from the patient's last physician, who wanted to know why no attempt was made to collapse the patient's right lung. It seemed as though the history was taken by an assistant who failed to obtain the information of the cerebral accident. A recent report reveals a spreading of her tuberculosis.

TREATMENT

Prophylactic. It is impossible to tell by X-ray alone whether a lung will respond to collapse therapy. After artificial pneumothorax has been decided upon, the patient is placed on his unaffected side and instructed not to move during the operation. He is permitted to talk and smile if he chooses, but he should not cough, because laughing or coughing forces the fluid from the manometer if the needle is in the pleural space. After the skin is sterilized, 1 per cent novocain solution is introduced into the subcutaneous tissues and parietal pleura. Care should be taken not to infiltrate the lung, or the patient will cough. An incision is made into the skin with a sharp scalpel, and a sharp but short canula forced through the subcutaneous tissues, which is followed by the introduction of the blunt pneumothorax needle through the canula into the pleural space. Normally the pressure in the pleural space is about —5 —2, but in tuberculosis, due to adhesions, inelasticity of the lungs, deformity of the ribs, or a fixed diaphragm, most any pressure will be registered. However, if

XUM

a low negative pressure—3 —1 or a positive pressure is found, proceed cautiously. Instruct the nurse to open the apparatus. If the patient does not complain of pain, administer 50 c.c. of air very cautiously, and never give more than 150 to 250 c.c. of air at the initial treatment, nor at subsequent treatments in these difficult cases. Some physicians advise lowering of the head during the refills with the idea the air will gravite to some other part of the body. Frequent fluoroscopic and X-ray examinations are essential in these cases. By them one is able to locate the air space, determine the elevation of the diaphragm, and tell whether the collapse is lateral or anterior-posterior. Don't hurry. Sometime ago J. B. Murphy suggested cutting down on the pleura in every case in order to prevent air embolism. Today Hamilton points out the first treatment should be given or supervised by one who has had considerable experience.

EMERGENCY TREATMENT

Should one suspect all is not going well, withdraw the needle at once. If there is evidence of shock, lower the head and give ½ c.c. of adrenalin intravenously, followed by ½ c.c. subcutaneously. The usual methods of resuscitation for cardiac failure and cerebral accidents are applied: adrenalin is injected into the cardiac muscle, artificial respiration is used, and warm blankets are applied to the body. After the patient has been returned to his room, special nursing care should be provided for at least twenty-four hours. Following the initial attack, the patient should be treated symptomatically until complete recovery.

SUMMARY

1. Air embolism is the most dangerous complication of artificial pneumothorax.

2. The treatment is similar to that used in any other type of embolism of the brain and heart.

A SIMPLE METHOD FOR INFANT FEEDING—WELL ADAPTED TO THE RURAL DISTRICTS.

J. H. HIDEN, M. D.,
Pungoteague, Va.

In discussing infant feeding I am not posing as a child specialist, nor am I ready to assume a scientific air and go into any complex discussion on infant nutrition, with side lights upon the delicate structures of the infant's nervous system, the corollary influences of the internal secretions, the sympathetic irritations from the disordered structures or organs of the body of these highly sensitive little ones in the course of their growth and development. Nor am I ready to go into an analysis of the vitamins with hair-splitting discussions of the various proportions that should be used in any given case. I am perfectly contented to let the modern baby specialist busy himself with all these scientific questions of the most delicate and accurate adjustments, if not always to his patient, at least to his own conception of the case in question.

With this introduction it seems to me, as a plain general practitioner, that we ought to find, amidst all the complex literature upon the subject, some simple, common-sense way of treating the great majority of babies in the summer months that can easily be handled by the average family doctor, and can be carried out by the average mother in moderate financial circumstances.

After reading many so-called scientific articles on infant feeding, and also after being pitifully humbugged by the products of many of the commercially inspired medical "manufacturing chemists" who extol their scientific achievements in infant feeding, I finally stumbled upon a course that has given me great satisfaction. This came about by realizing that nearly all of the highly advertised prepared foods for infant feeding were too expensive for continued use in the average family in the rural districts, and that nearly all of these prepared foods were disappointing in my own experience.

I then decided that I would have to adopt either fresh cow's milk or the prepared condensed milk as the best hope for the babies under my care, except in such cases as were fortunate enough to have suitable mother's milk. In facing this problem I realized that the cow's milk would have to be pas-

XUM

teurized, or boiled and modified, to make it suitable as a food, and even then, great care should be constantly observed to keep it pure and free from bacteria. Then again, if the condensed milk was adopted, it also would have to be modified to meet the requirements for the digestion and for safety. Moreover, the condensed milk alone was lacking in nutrition, and in the heat of the summer favored intestinal disorders. After worrying over these problems with some successes and many failures to make the required adjustments in infant feeding, it occurred to me that about half of the whole world lived almost entirely upon rice and, that ages upon ages, in the world's experience had definitely proven that rice as a food was especially well adapted to the people who lived in the hot climates of the world. It then occurred to me that there must be much more nutrition in rice than the average physician ever realized. The next thought naturally followed: suppose I select condensed milk, add to it the required amount of boiled water to make it the right strength for any given infant, and then add to this one-fourth of its quantity of boiled rice in the form of a thin gruel, about as thick as cream. We would then have a feeding three-fourths modified condensed milk and one-fourth rice gruel. The quantity of this mixture for each feeding is regulated to suit the age and weight of the infant. We then have practically a sterile diet, easily digested and highly nutritious, and sufficiently balanced to meet the requirements in the great majority of cases. This feeding is given in the proper amount about every three hours, more or less, to suit the case. Here, I simply tell the mother to look on the can of the condensed milk, read the directions for the proper quantity of water to add to the milk for a feeding for a child of her baby's age, and to this feeding add one-fourth its quantity of rice gruel, prepared as above-stated. In addition to this diet I allow the child a little orange juice two or three times a day. When oranges cannot be secured, a little tomato juice may be substituted.

All this seems very simple—so much so that I find little or no difficulty in getting it into the heads of almost any of the mothers or nurses. Indeed, it is easily understood and carried out, very inexpensive and, in my practice for the last twenty years, has given me far better results than any other method of infant feeding I have ever tried. The only objection I see against it is that it might appear to some very "scientifically inclined" as void of "scientific accuracy." There is no phraseology of the metric system, no centimeters and calories to confuse the poor mothers and fill them with awe, but I feel that we can afford to dispense with these technical expressions as long as the babies are doing well.

Books Available to Doctors.

The following new books are among those at the Library of the Medical College of Virginia available to members of the Medical Society of Virginia, the only cost being return postage:

Astbury, W. T.—Fundamentals of fibre structure.

Barcroft, Joseph—The respiratory function of the blood. Part 1—Lessons from high altitudes.

Beaman, A. Gaylord—A doctor's odyssey.

Brim, Charles J.—Medicine in the Bible.

Brown, Percy—American martyrs to science through the roentgen rays.

Buehler, E. C.—Free medical care.

Chayer, Mary Ella—Bibliography in health education for schools and colleges.

Clark, Mary—Memories of Jane A. Delano.

Clark, W. Irving, and Drinker, P.—Industrial medicine.

Clayton, William—The theory of emulsions and emulsification.

Clendening, Logan—Balanced diet.

Coffman, H. C.—American foundations.

Cushing, Harvey—From a surgeons journal.

Davidson and Gulland—Pernicious anemia.

Dixon, M.—Manometric methods as applied to the measurement of cell respiration.

Duggar, B. M. ed.—Biological effects of radiation.

Dunning, W. B., and Davenport, S. E., Jr.—Dental dictionary.

East, W. N.—Medical aspects of crime.

Enoch Pratt Free Library—Staff instruction book.

Feldman, W. M.—The principles of child physiology, pure and applied.

Fisher, R. A.—The design of experiments.

Freundlich, H.—Colloid and capillary chemistry.

Golden, Ross, ed.—Diagnostic roentgenology.

Goodale, R. H.—Interpretation of laboratory findings.

Grollman, Arthur—The adrenals.

Haggard and Fry—The anatomy of personality.

Hartman, Carl G.—Time of ovulation in women.

Henshaw, Henry W.—The book of birds.

Herrmann, G. R.—Synopsis of diseases of the heart and arteries.

Himes, N. E.—Medical history of contraception.

Laignel-Lavastine and Molinery, M. R.—French medicine.

Presidents and Places of Meetings of the Medical Society of Virginia

PRESIDENT	PLACE OF MEETING	YEAR OF MEETING
*Dr. R. S. Payne, Lynchburg	Richmond	1870
*Dr. R. S. Payne, Lynchburg	Lynchburg	1871
*Dr. A. M. Fauntleroy, Staunton	Staunton	1872
*Dr. Harvey Black, Blacksburg	Norfolk	1873
*Dr. A. G. Tebault, London Bridge	Abingdon	1874
*Dr. S. C. Gleaves, Wytheville	Richmond	1875
*Dr. F. D. Cunningham, Richmond	Charlottesville	1876
*Dr. J. L. Cabell, University	Petersburg	1877
*Dr. J. H. Claiborne, Petersburg	Richmond	1878
*Dr. L. S. Joynes, Richmond	Alexandria	1879
*Dr. Henry Latham, Lynchburg	Danville	1880
*Dr. Hunter McGuire, Richmond	Old Point Comfort	1881
*Dr. G. W. Semple, Hampton	Fauquier White Sulphur Springs	1882
*Dr. W. D. Cooper, Morrisville	Rockbridge Alum Springs	1883
*Dr. J. E. Chancellor, Charlottesville	Rawley Springs	1884
*Dr. S. K. Jackson, Norfolk	Alleghany Springs	1885
*Dr. Rawley W. Martin, Chatham	Fredericksburg	1886
*Dr. Bedford Brown, Alexandria	Richmond	1887
*Dr. Benjamin Blackford, Lynchburg	Norfolk	1888
*Dr. E. W. Row, Orange C. H.	Roanoke	1889
*Dr. Oscar Wiley, Salem	Rockbridge Alum Springs	1890
*Dr. W. W. Parker, Richmond	Lynchburg	1891
*Dr. H. Grey Latham, Lynchburg	Alleghany Springs	1892
*Dr. Herbert M. Nash, Norfolk	Charlottesville	1893
*Dr. Wm. P. McGuire, Winchester	Richmond	1894
*Dr. Robt. J. Preston, Abingdon	Wytheville	1895
*Dr. Wm. L. Robinson, Danville	Rockbridge Alum Springs	1896
*Dr. Geo. Ben Johnston, Richmond	Hot Springs	1897
*Dr. Lewis E. Harvie, Danville	Virginia Beach	1898
*Dr. Jacob Michaux, Richmond	Richmond	1899
*Dr. Hugh T. Nelson, Charlottesville	Charlottesville	1900
*Dr. J. R. Gildersleeve, Tazewell	Lynchburg	1901
*Dr. R. S. Martin, Stuart	Newport News	1902
*Dr. J. N. Upshur, Richmond	Roanoke	1903
*Dr. Joseph A. Gale, Roanoke	Richmond	1904
*Dr. Wm. S. Christian, Urbanna	Norfolk	1905
Dr. Lomax Gwathmey, Norfolk	Charlottesville	1906
Dr. Paul B. Barringer, Charlottesville	Chase City	1907
*Dr. Wm. F. Drewry, Petersburg	Richmond	1908
Dr. Stuart McGuire, Richmond	Roanoke	1909
*Dr. E. T. Brady, Abingdon	Norfolk	1910
*Dr. O. C. Wright, Jarratt	Richmond	1911
*Dr. Hugh M. Taylor, Richmond	Norfolk	1912
*Dr. Southgate Leigh, Norfolk	Lynchburg	1913
*Dr. Stephen Harnsberger, Catlett	Washington, D. C.	1914
*Dr. Samuel Lile, Lynchburg	Richmond	1915
Dr. Joseph A. White, Richmond	Norfolk	1916
Dr. Geo. A. Stover, South Boston	Roanoke	1917
*Dr. E. G. Williams,† Richmond	Richmond	1919
*Dr. Paulus A. Irving, Farmville	Petersburg	1920
*Dr. Alfred L. Gray, Richmond	Lynchburg	1921
*Dr. E. C. S. Taliaferro, Norfolk	Norfolk	1922
*Dr. John Staige Davis, University	Roanoke	1923
*Dr. W. W. Chaffin, Pulaski	Staunton	1924
Dr. Hunter H. McGuire, Winchester	Richmond	1925
Dr. W. L. Harris, Norfolk	Norfolk	1926
Dr. J. Shelton Horsley, Richmond	Petersburg	1927
Dr. J. W. Preston, Roanoke	Danville	1928
Dr. J. Bolling Jones, Petersburg	Charlottesville	1929
*Dr. Charles R. Grandy, Norfolk	Norfolk	1930
Dr. J. Allison Hodges, Richmond	Roanoke	1931
Dr. I. C. Harrison, Danville	Richmond	1932
Dr. J. C. Flippin, University	Lynchburg	1933
Dr. R. D. Bates, Newtown	Alexandria	1934
Dr. F. H. Smith, Abingdon	Norfolk	1935
Dr. P. St. L. Moncure, Norfolk	Staunton	1936

*Deceased.
†Owing to influenza epidemic and World War, meeting was not held in 1918, and Dr. Williams held over as President.

XUM

PROGRAM

MEDICAL SOCIETY OF VIRGINIA

Sixty-seventh Annual Session

Staunton, Virginia

OCTOBER 13, 14 and 15, 1936

HOTEL STONEWALL JACKSON—*Headquarters*

SCIENTIFIC PROGRAM

GENERAL SESSION

Tuesday, October 13

8:00 P. M.

Call to Order—GUY R. FISHER, M. D., Chairman, Committee of Arrangements.

Invocation—REV. J. L. GIBBS, D. D.

Address of Welcome—HON. WM. A. GRUBERT, Mayor of Staunton.

Announcements.

Address of President—The South in Medicine and Surgery—P. ST. L. MONCURE, M. D., Norfolk.

Memorial Hour.

Address—W. D. HAGGARD, M. D., Nashville, Tenn. (*Invited guest.*)

Smoker—10:00 P. M.

Wednesday, October 14

9:00 A. M.

Medical and Surgical Sections

Medical Section—Hotel Stonewall Jackson

Studies upon the Persistence of Action of Digitalis and Digitalis Bodies.

H. B. HAAG, M. D., Richmond.

The results of this experimental investigation indicate that the persistence of effect of digitalis bodies should be taken into account in calculating their clinical dosage.

Discussion opened by James P. Baker, M. D., Richmond.

Passive Vascular Exercises in the Treatment of Peripheral Vascular Disease.

WILLIAM B. PORTER, M. D., Richmond.
N. BLOOM, M. D., Richmond.

The paper will endeavor to simplify and differentiate the various peripheral disorders and will contain a brief outline of the several methods of treatment, including the authors' experience with the Pavex machine.

Discussion opened by Walter B. Martin, M. D., Norfolk.

Adhesive Pericarditis with Decompensation: Treatment by Evulsion of the Left Phrenic Nerve.

WALTER B. MARTIN, M. D., Norfolk.

Three cases are reported with severe long-standing decompensation, in which the left phrenic nerve was resected. Prompt and complete relief of symptoms of decompensation was obtained. Diagnostic criteria are reviewed, and an attempt is made to establish a rational basis for the selection of cases suitable for this procedure.

Discussion opened by Hugh H. Trout, M. D., Roanoke.

Angina Pectoris and Insulin.

WILLIAM R. JORDAN, M. D., Richmond.

Insulin is too important in preserving health to exclude its use. Proper dosage is essential. Three cases of angina pectoris due to overdosage are reported.

Discussion opened by Ernest S. Scott, M. D., Lynchburg, and Paul Camp, M. D., Richmond.

Hemihypertrophy: Report of Case Probably Acquired and Associated with a Pituitary Tumor.

FRANK A. STRICKLER, M. D., Radford.

Complete congenital hemihypertrophy is a rare condition. Acquired hemihypertrophy has not been reported. A case of complete hemihypertrophy is described as found in a large white man, the right arm being one inch longer and the right leg one and one-half inch longer than the left. Other measurements and studies to be included. X-ray evidence of a pituitary tumor found.

Discussion opened by Hugh H. Trout, M. D., Roanoke.

Treatment of Pulmonary Tuberculosis.

DEAN B. COLE, M. D., Richmond.
WALTER L. NALLS, M. D., Richmond.

The economic problem is probably the greatest single factor influencing the treatment of pulmonary tuberculosis. The program of treatment is outlined recommending the utilization of modern weapons.

Discussion opened by C. L. Harrell, M. D., Norfolk.

Pneumonia: Especially Seventy-Seven Diathermed Cases.

J. O. FITZGERALD, M. D., Richmond.

Briefly covers pneumonia in some of its treatments and discusses diathermy treatment, placing emphasis on its use as an adjunct in pneumonia treatment.

Discussion opened by B. M. Rosebro, M. D., Richmond.

Surgical Section—Corporation Court Room, City Hall

Carcinoma of the Sigmoid and Rectum: Common Diagnostic Errors Which Are Readily Avoidable; Case Reports.

A. STEPHENS GRAHAM, M. D., Richmond.

Fifty per cent of a surgical series were originally incorrectly diagnosed bleeding piles or colitis yet only two required diagnostic measures not available to every physician.

Discussion opened by R. DuVal Jones, M. D., Norfolk.

Some Observations in the Management of Foreign Bodies in the Air and Food Passages (*lantern slides*).

E. G. GILL, M. D., Roanoke.

In every case of a suspected foreign body, a careful and complete history should be obtained, and a negative report should not be given until every diagnostic means has been employed, including a complete physical examination, X-ray, and fluoroscopic examination, and finally in certain cases a diagnostic bronchoscopy. The longer the foreign body remains, the more difficult it is to remove.

Bronchoscopic Observation of Laryngo-Tracheo Bronchitis in Children with Obstructive Dyspnea.

E. T. GATEWOOD, M. D., Richmond.

The severe streptococcic type produces tenacious semi-solid plugs in the bronchi with atelectasis. The disease is frequently treated as diphtheria or non-opaque foreign body in the air passages. Laryngeal obstruction is not uncommon.

Discussion opened by Basil Jones, M. D., Richmond.

Some Points of Interest in the Treatment of Fractures of Long Bones by the Use of an Improved Fracture Reducing Frame. (*Lantern slides.*)

CHAS. W. PUTNEY, M. D., Staunton.

Certain fundamental principles in the treatment of fractures are reviewed. A fracture frame is presented which has proven of considerable value in reducing many of the more difficult fractures and dislocations of long bones.

Discussion opened by Robt. V. Funsten, M. D., University of Virginia.

Treatment of Penetrating Wounds of the Brain, with and without Retained Foreign Bodies.

C. C. COLEMAN, M. D., Richmond.

The purpose of this paper is to discuss the operative treatment of penetrating wounds of the brain, caused by compound fractures of the skull, bullets and sharp-pointed instruments. Practically all cases should be operated upon.

Surgery of the Thyroid Gland.

J. M. EMMETT, M. D., Clifton Forge.

Review of a group of operations upon the thyroid gland. Distinction is drawn between the treatment of adenomas of the thyroid and acute hyperplastic changes. The results of complete thyroidectomy for the treatment of hypertensive heart disease are also discussed.

Radium in the Treatment of Non-Malignant Diseases of the Uterus.

W. LOWNDES PEPLE, M. D., Richmond.

A workable clinical classification based on gross pathology. Intelligent painstaking care in the selection of the case and in the application of the correct dosage. A warning is given against the misuse of radium for uterine hemorrhage.

Discussion opened by A. P. Jones, M. D., Roanoke, and J. Bolling Jones, M. D., Petersburg.

General Sessions

Wednesday, 3:00 P. M.

Hotel Stonewall Jackson

Intestinal Hemorrhage and Its Treatment.

OSCAR L. HITE, M. D., Richmond.

The various causes of intestinal hemorrhage are discussed. Treatment, both medical and surgical, are considered. The prognosis based on direct visualization is discussed.

Discusion opened by Donald S. Daniel, M. D., Richmond.

Study of 500 Cases of Psychoneurosis.

DAVID C. WILSON, M. D., University of Virginia.

Since 1930 over 500 cases showing a psychoneurotic reaction have been seen in the University of Virginia Hospital. A large majority of this group were treated in the wards of the hospital. Since that time they have been followed up and their status determined and this study reports the methods of therapy used, types of cases handled and the results obtained as far as could be determined.

Discussion opened by Alex. F. Robertson, Jr., Staunton.

Address—Tuberculosis of the Skin. (*Lantern slides.*)

LLOYD W. KETRON, M. D., Baltimore, Md. (*Invited guest.*)

Remarks on Prostatic Obstructions Observed During a Ten-Year Period.

JOHN H. NEFF, M. D., University of Virginia.

E. W. KIRBY, M. D., University of Virginia.

Study to emphasize pathological changes of prostatism, dangers in delayed recognition, frequency of cancer, safest methods of first attention at home. Surgical results are reported.

Discussion opened by W. W. S. Butler, M. D., Roanoke.

Syphilis—A Major Social Problem.

R. W. GARNETT, M. D., Danville.

The attitude toward syphilis on the part of informed citizens, of social minded publicists, of progressive public health workers and of up-to-date practicing physicians has been undergoing a very significant evolution in recent years. There s now a manifestly increasing willingness to face this disease in the open and to deal with it frankly as a public health menace as well as a medical problem with far-reaching significance socially, economically and racially. Widespread public health education and adequate treatment facilities within the economic range of all the people constitute the major factors in the comprehensive program to which the medical and social forces of our country must address themselves.

Discussion opened by E. E. Barksdale, M. D., Danville, and D. C. Smith, M. D., University of Virginia.

Deficiency Disease the Result of Interference with Absorption from the Gastro-Intestinal Tract: Case Reports.

T. DEWEY DAVIS, M. D., Richmond.

Disease the result of vitamin deprivation has been thoroughly established. Castle's work in founding a conditional deficiency in pernicious anemia is accepted, but insufficient

XUM

attention has been paid to deficiency in absorption from the gastro-intestinal tract.

Discussion opened by Alex. F. Robertson, Jr., M. D., Staunton.

Wednesday, 6:30 P. M.

Social Evening—Informal

Alumni, Fraternity or Special Society dinners (*subscription*). Reservations to be made at Registration Desk.

10:00 P. M.

Reception and Dance

Thursday, October 15

9:00 A. M.

Symposium on the Endocrine Diseases

The Endocrines in Medicine.

E. L. ALEXANDER, M. D., Newport News.

The Endocrines in Obstetrics and Gynecology.

C. J. ANDREWS, M. D., Norfolk.

The Endocrines in Surgery.

EDWIN P. LEHMAN, M. D., University of Virginia.

Discussion opened by James H. Smith, M. D., Richmond.

Rupture of Graafian Follicle: Etiology, Pathology, Symptoms, Differential Diagnosis and Treatment with Study of Case Reports. (*Lantern Slides.*)

HERBERT C. JONES, M. D., Petersburg.

The writer has been impressed with how frequently pathological ruptures of a Graafian follicle occur in the average general surgical practice. Several cases have occurred which simulated ectopic pregnancy, other cases have been operated on with a diagnosis of acute appendicitis and in other cases appendectomy was done for a chronic appendix with persistence of symptoms. Several of these cases have been studied for a period of a year following the removal of the appendix.

Discussion opened by John S. Horsley, Jr., M. D., Richmond.

Stone in the Urinary Tract: Present Concepts of Etiology and Preventive Therapy Against Recurrence. (*Lantern slides.*)

LINWOOD D. KEYSER, M. D., Roanoke.

Stone due to several different mechanisms. Hyperexcretion calculosis and encrustation calculosis defined with outline of experimental and clinical features. Stasis factor. Metabolic factors. Vitamin deficiency. Therapy of dissolution and prevention of recurrence. Advantages and limitations of measures in treatment. Illustrative cases.

Discussion opened by Joseph F. Geisinger, M. D., Richmond.

Some Further Observations of Sulphur Metabolism as a Possible Factor in Arthritis.

THOMAS WHEELDON, M. D., Richmond.

Use of colloidal sulphur in arthritis offers hope of benefit. No serious toxic effects have been observed. Investigation of the sulphur controlling elements is under way.

Discussion opened by Manfred Call, Sr., M. D., Richmond.

Special Order—Report from House of Delegates.

Induction of President.

Adjournment.

Time limit for papers—fifteen minutes; Discussions—five minutes.

Papers are the property of the Society and should be handed the reporter immediately after presentation.

Abstracts

Vacation Post-Graduate Cruise, Seaboard Medical Association of Virginia and North Carolina, S. S. Reliance, June 14 to 19, 1936.

We present briefly abstract of the addresses given by the eight well-known instructors aboard.

THE RELATION OF NUTRITIONAL DEFICIENCIES TO THE DEVELOPMENT OF HEART FAILURE IN ORGANIC HEART DISEASE

WILLIAM B. PORTER, M. D., RICHMOND, VA.

In this discussion an attempt was made to call attention to the factors concerned in heart failure and to note that heart failure as such is not primarily a problem of increased work, but in the final analysis is a ratio existing between work and the physical fitness of the heart muscle. It is a general discussion of the factors concerned in heart muscle physiology as it concerns the various chemical and biological substances which are important and in most instances obligatory for normal muscle physiology.

Beriberi heart disease due to B1 deficiency is a definite entity characterized by varying degrees of cardiac dilatation, the phenomena of heart failure, and is promptly relieved by adequate diet containing a large amount of vitamin B1.

Three cases were presented in which the usual factors concerned with the precipitation of heart failure do not exist. They did, however, show the signs of organic disease, particularly insufficiency of the coronary blood flow. Following therapy which consisted largely of bed rest and adequate diet, all clinical phenomena of heart failure promptly disappeared and there was in every instance a marked reduction in cardiac size. It was concluded, therefore, that these patients had organic heart disease but that the heart failure was precipitated by subclinical degrees of B1 avitaminosis and probably diets containing inadequate quantities of complete

proteins. The age of the patients and other physical data suggest that varying degrees of coronary insufficiency existed in these patients.

It is suggested that such patients are peculiarly liable to the serious consequences of subclinical deficiency diseases for, with a reduction in the coronary blood flow, it is obligatory that the concentration of all essential elements be increased lest cell metabolism suffer.

THE PATHOLOGY OF APPENDICITIS

HUBERT A. ROYSTER, M. D., RALEIGH, N. C.

There is no intelligent understanding of disease without knowledge of the pathology. How well is it known that the pathology of pneumonia (lobar) is divided into four stages; the diagnosis and management depending on the appreciation of what these stages mean,—what is going on inside the lung; yet the most frequent of all acute abdominal ailments, appendicitis, the pathological significance back of the clinical events is ignored by most of us who are deeply concerned with the story of the attack, symptomatology, physical examination, diagnosis, not keeping a mental picture of the pathological stages, thus losing a true conception of the malady.

Admitting that there is a greater difficulty in acquiring an understanding of the diseased appendix than of the diseased lung, there is a reason for a high value to be placed on a knowledge of appendiceal pathology, supplemented by accumulated experience. Where no chances are given, no chances should be taken.

The morbid anatomy of appendicitis is considered in four stages:

(a) *Endo-appendicitis:* "Inside" appendicitis, involving the mucous membrane; often called "catarrhal," a dangerous and misleading term; there are cloudy swelling, infiltration, ulceration, stricture.

(b) *Parietal appendicitis:* Involving the wall of the appendix; may result from extension from the mucous membrane or from a distant area through the blood stream; edema, lymph-block, emboli, permanent thickening are present.

(c) *Peri-appendicitis:* Inflammation "around" the appendix; involvement of its peritoneal covering, the first step outside; the serious coat is often the last to give way, holding on and producing adhesions—Nature's effort toward cure.

(d) *Para-appendicitis:* Inflammation going "beyond" the appendix, extension outside its borders; perforation with or without gangrene; diffused peritonitis, exudate, abscess metastases through veins or lympathics to other regions.

The process may proceed to fulfilment without passing through these distinct periods. It is usual for the pathological process to carry on regularly. Let us bear in mind that the inflammation begins in the mucosa, then in the wall, then the serosa, then beyond the appendix, invading other structures.

The conveyance of bacteria to the wall of the vermiform appendix by the blood stream has been definitely proved by the intravenous injection in rabbits of streptococci and colon bacilli from an infected appendix.

Destructive lesions of the appendix are more often due to embolism of the appendiceal artery, many times primary incident. A close examination of an appendix will reveal the clot in the artery opposite the upper level of the gangrenous field. The appendix can be a primary focus or a secondary focus, as is unquestionably proved through research and clinical study.

Dr. Royster, in response to a question,—"what is the physiology of the appendix?" answered that from his frequent observation of normal appendices when inspecting the viscera in abdominal sections, a very distinct regular peristaltic wave from its apex to its base is observed; therefore, he is forced to conclude that its physiology is "a hydrostatic agent which pushes the contents of the caecum upward." This is why people lying in bed have sluggish bowel movements. The active peristalsis in the normal appendix is a definite function, but when once diseased, always diseased; a damaged appendix never recovers.

On questioning a patient with an acute abdomen, a large per cent will answer in the negative as to prior attacks; but upon close scrutiny, careful questioning of him and his family, one will elicit history of his having had colic, acute indigestion, "spells," cramps, "stomach trouble," etc., during a period of months or years in about 98 per cent of the cases. The average lapse from the first "colic" to the operation table is two years. If the patient thinks that the present attack is his first, it usually means that it is his worst.

In view of the foregoing, Dr. Royster felt justified in the following conclusions:

In every case of appendicitis culminating in an

XUM

acute attack, there have been previous pathological lesions. Nature always gives a warning; we do not always heed the warning; we treat too lightly the pathology of the disease. Appendicitis is a continuing process, a going concern; once appendicitis, always appendicitis until the assassin is executed. A patient who has appendicitis has a chance of recovery other than surgery (ultimate recovery) one time in fifty, as proven by carefully taken statistics. The attack is not the disease, but a knock at the door, a call for help, an accumulation of pathological changes in a rudimentary, non-resistant, closed end tube. Damage proceeds between as well as during an attack. Appendicitis is merely a symptom-complex, evidence of deep and real pathology. We cannot believe a normal healthy appendix can perforate, gangrene or even suppurate in a few hours' time. These processes cannot happen *dė novo* over night. Examination of specimens removed in supposedly spontaneous cases have all revealed pathological evidence of a more or less long duration.

The dangers in appendicitis are two: PROCRASTINATION and PURGATIVES. How can anyone attempt to "freeze it out" with an ice-bag, or assume the patient is well when the attack has subsided? He is really a candidate for future attacks, these may be as late as twenty years afterward. If we medical men would think seriously of the pathology of appendicitis, dangerous delay and criminal cathartics would be eliminated forever; the cases would approach the operating table with only a mildly morbid appendix, whose removal is simple, as against a violent and dangerous field to be approached.

No human being should ever die of the disease. Familiarity with its pathology is the surest approach to this ideal.

CLARENCE PORTER JONES, M. D.,
Secretary.

(*To be continued*)

Public Health Statistics

I. C. RIGGIN, M. D.
State Health Commissioner of Virginia

The communicable disease report received at the office of Dr. G. F. McGinnes, State Epidemiologist, for the month of July, 1936, shows the following cases compared with the same month in 1935.

	1936	*1935*
Typhoid and Paratyphoid	51	125
Diphtheria	19	37
Scarlet Fever	45	51
Measles	215	211
Meningitis	14	15
Poliomyelitis	3	243
Rocky Mountain Spotted Fever	12	13
Typhus Fever	0	2
Undulant Fever	1	3
Tularaemia	3	4
Smallpox	0	1

BUREAU OF INDUSTRIAL HYGIENE

The State Department of Health announces the inauguration of a program of industrial hygiene. On July 1, 1936, the Bureau of Industrial Hygiene was formed. Dr. William D. Tillson has been appointed director of this new bureau.

That the protection of the health of the industrial population of Virginia constitutes an important problem affecting not only the welfare of the industrial employees themselves but also the welfare of the general population and the progress of industry in the State, has been recognized. In the past, limited finances would not permit an adequate program of industrial hygiene but with Federal funds now available through the Social Security Act this phase of Public Health Service in Virginia has been made possible.

From 1900 to 1933 the average number of wage earners in manufacturing industries in Virginia increased by 52 per cent as compared with an average increase of 28.5 per cent in the United States as a whole, according to data compiled by the State Planning Board. In 1930 Virginia had 221,539 persons engaged in manufacturing, mechanical and mineral industries. Of these, about 63,000 were engaged in occupations associated with specific industrial hazards. The increase in the number of industries in Virginia within the past few years and very probable continuation of this increase emphasizes the importance of a program such as will be fostered by the Bureau of Industrial Hygiene.

Logically the first activity of this bureau will be a preliminary survey to determine the scope and nature of the industrial hygiene problems in Virginia. The services of the bureau will be available to industries which desire information as to actual hazards to which their employees are exposed, such as determinations of concentrations of dust, fumes, vapors, et cetera, and the efficiency of ventilation and other equipment used for the alleviation of such

hazards. The bureau will provide a source of information for other State departments, and for agencies or persons interested in industrial hygiene.

The Bureau of Industrial Hygiene will cooperate with the State Department of Labor, the Virginia Industrial Commission, the State Medical Society, the State Planning Board, and other organizations or individuals concerned with the control of occupational diseases.

Woman's Auxiliary to the Medical Society of Va.

President—MRS. FLETCHER J. WRIGHT, 49 S. Market St., Petersburg.

President-Elect—MRS. F. D. WILSON, 5352 Studley Ave., Norfolk.

Corresponding Secretary—MRS. MEADE EDMUNDS, Walnut Hill, Petersburg.

Recording Secretary—MRS. HAROLD W. POTTER, 70 33rd St., Newport News.

Treasurer—MRS. REUBEN F. SIMMS, 2502 Hawthorne Ave., Richmond.

Chairman, Press and Publicity—MRS. JAMES B. STONE, 15 Maxwell Road, Richmond.

PROGRAM

Fourteenth Annual Meeting
Stonewall Jackson Hotel
Staunton, Virginia October 13-14-15, 1936

Every woman attending the Convention is cordially invited to attend these meetings.

Tuesday, October 13th

Registration 5:00 to 8:00 P. M. at the Stonewall Jackson Hotel.

Every woman is requested to register immediately upon arrival.

8:00 P. M.—Opening meeting of the Medical Society of Virginia.

Wednesday, October 14th

8:00 A. M.—Registration Booth open. Stonewall Jackson Hotel.

9:00 to 10:00 A. M.—Pre-Convention Board Meeting. Stonewall Jackson Hotel.

All County Presidents, Presidents-Elect (or Vice-President where there is no President-Elect) and State Officers and Chairmen are expected to attend this meeting.

10:15 A. M. to 1:00 P. M.—GENERAL ANNUAL MEETING—Open to all women attending the Convention.

President—Mrs. Fletcher J. Wright, Petersburg.

Invocation—Mrs. Robert M. Woodhouse, Virginia Beach.

Address of Welcome.

Response—Mrs. Joseph Bear, Richmond.

Report of Committee on Arrangements—Mrs. Franklin M. Hanger, Chairman, Staunton.

Roll Call of County Auxiliaries—Mrs. Harold W. Potter, Newport News.

In Memoriam.

Minutes Thirteenth Annual Convention—Recording Secretary, Mrs. Harold W. Potter, Newport News.

President's Message—Mrs. Fletcher J. Wright, Petersburg.

President's Announcements.

Reports:

Corresponding Secretary—Mrs. Meade Edmunds, Petersburg.

Treasurer—Mrs. Reuben F. Simms, Richmond.

Organization—Mrs. Franklin D. Wilson, Norfolk.

Program and Health Education—Mrs. T. Elmore Jones, Portsmouth.

Finance—Mrs. James K. Hall, Richmond.

Legislation—Mrs. Thos. W. Murrell, Richmond.

Public Relations—Mrs. C. J. Devine, Norfolk.

Hygeia—Mrs. Herbert C. Jones, Petersburg.

Revisions—Mrs. Eugene Lowenberg, Norfolk.

Press and Publicity—Mrs. James B. Stone, Richmond.

Courtesy—Mrs. Richard P. Bell, Staunton.

Exhibits—Mrs. Henry M. Snead, Petersburg.

Jane Todd Crawford Memorial—Mrs. E. L. Alexander, Newport News.

Historian, Archives and Research—

Parliamentarian—Mrs. M. N. King, Norfolk.

County Presidents:

Mrs. Harold W. Potter, Newport News, Auxiliary to Warwick County Medical Society.

Mrs. A. G. Shetter, Richmond, Auxiliary to Richmond Academy of Medicine.

Mrs. E. L. McGill, Petersburg, Auxiliary to Petersburg Unit of the Fourth District Medical Society.

Mrs. C. C. Smith, Norfolk, Auxiliary to Norfolk Medical Society.

Mrs. Hawes Campbell, Venter, Auxiliary to Mid-Tidewater Medical Society.

Mrs. John Hundley, Jr., Lynchburg, Auxiliary to Lynchburg Academy of Medicine.

Mrs. A. M. Sneed, Toano, Auxiliary to James City-New Kent County Medical Society.

Mrs. H. A. Latane, Alexandria, Auxiliary to Alexandria Medical Society.

Mrs. R. M. Woodhouse, Virginia Beach, Auxil-

XUM

iary to Princess Anne County Medical Society.
Mrs. H. L. Denoon, Jr., Nassawadox, Auxiliary to Accomac and Northampton Medical Society.

Delegates:

Woman's Auxiliary to American Medical Association; Mrs. Fletcher J. Wright, Petersburg.
Woman's Auxiliary to Southern Medical Association; Mrs. Southgate Leigh, Norfolk.

Unfinished Business.

New Business.

Reports:

Committee on Resolutions.
Committee on Credentials.
Nominating Committee.

Election of Officers.

1:30 P. M.—Auxiliary Luncheon. (Subscription.)

Honoring Mrs. Robert E. Fitzgerald, President. Auxiliary to American Medical Association.

Greetings:

Dr. P. St. L. Moncure, President of the Medical Society of Virginia.
Dr. Guy R. Fisher, President of Augusta County Medical Society.
Dr. J. M. Hutcheson, President-Elect of Medical Society of Virginia.
Members of Advisory Council:
Dr. J. Allison Hodges, Richmond.
Dr. Fletcher J. Wright, Petersburg.

Address:

Mrs. Robert E. Fitzgerald, Wauwatosa, Wisconsin, President, Auxiliary to American Medical Association.

Installation of Officers conducted by Mrs. M. N. King, of Norfolk.

Presentation of Gavel.

Inaugural Message of President—Mrs. Franklin D. Wilson, Norfolk.

Adjournment.

Entertainments
Wednesday, October 14th

3:00 P. M.—Trip over Skyline Drive.

10:00 P. M.—Reception and Dance.

Mrs. J. Allison Hodges.

News of the sudden death of Mrs. J. Allison Hodges, on August 8th in Montreat, N. C., where she and Dr. Hodges were spending the summer, comes as a distinct shock and brings sorrow to the heart of every member of the Auxiliary. Mary Gray Hodges was one of the founders of the Virginia Auxiliary. In 1922 she worked diligently with Dr. and Mrs. Southgate Leigh of Norfolk to bring about the realization of Dr. Leigh's idea to form an Auxiliary in the State of Virginia. She was its first Chairman of Organization. In 1925, in the capacity of Vice-President, she took the chair and presided at the Annual Meeting due to the illness of the President. She served the Auxiliary as President for the years 1931 and 1932. Mrs. Hodges was the possessor of a magnetic personality. She was a woman of wide interests. Many and varied were the women's organizations in Richmond and throughout the State to which she gave untiringly of her time and efforts. In the death of Mrs. Hodges the Auxiliary has lost one of its staunchest members. Her presence and help will be missed in every phase of the Auxiliary's activities. The influence of her work in the past will be a living memorial to her, and should inspire the Auxiliary to great achievements in the future.

Truth About Medicine

In addition to the articles previously enumerated, the following have been accepted by the Council on Pharmacy and Chemistry of the American Association:

E. R. Squibb & Sons.

Gas Gangrene Antitoxin—Squibb.

Tetanus-Gas Gangrene Antitoxin—Squibb.

New and Nonofficial Remedies

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies:

Hypodermic Tablets Metrazol 1½ grains.—Each tablet contains Metrazol (New and Nonofficial Remedies, 1935, p. 322) sufficient to insure the administration of 1½ grains of Metrazol in solution. Bilhuber-Knoll Corporation, Jersey City, N. J.

Compressed Tablets Sal-Ethyl Carbonate with Phenacetin.—Each tablet contains sal-ethyl carbonate (New and Nonofficial Remedies, 1935, p. 358) 0.23 Gm. (3½ grains) and phenacetin (acetophenetidin—U.S.P.) 0.1 Gm. (1½ grains). Parke, Davis & Co., Detroit.

Book Announcements

New Plans of Medical Service. Examples of Organized Local Plans of Providing or Paying for Medical Services in the United States. The Julius Rosenwald Fund. Chicago. 1936. Pamphlet of 74 pages.

Illustrious Contributors to Public Health. Being the Names Carved on the New Building to House the Departments of Health, Hospitals and Sanitation, and the Office of the Chief Medical Examiner. A

Souvenir Prepared for the Dedication Exercises on Tuesday, November 26, 1935. By Charles Frederick Bolduan, M. D., Department of Health, City of New York. Privately Printed. 1936. Octavo of 33 pages. Cloth.

The Baby and Growing Child. Feeding and Health Care. For Physicians, Mothers, and Nurses. By LOUIS FISCHER, M. D., Consulting Physician to the Willard Parker Hospital, New York City; Consulting Physician to St. Vincent's Hospital, Montclair, N. J., etc. Funk and Wagnalls Company. New York and London. 1936. 12mo of 260-xvi pages. Illustrated. Cloth. Price, $1.50.

This is a book apparently intended for a mothers' guide book in feeding and general care of children. It is stated in several places throughout the book that certain treatments advised are to be used only until a doctor can be summoned.

The first section of the book on the *General Hygiene of the Infant* includes chapters on the nursery, bathing and care of the navel, clothing and training of the infant, which should be very useful to the mother, and includes the kind of information which physicians sometime do not take time or thought to impart. However, included in this section are a chapter each on the X-ray and blood transfusion, for which no justification can be seen and which might lead to misunderstanding between the mother and her own physicians.

The other sections of the book concern *Feeding, Nervous Manifestations* and *Diseases of Various Sorts.* Here and there is a bit of knowledge which should be useful to the mother, but much of it could be misinterpreted and misleading in the face of her limited medical knowledge. Especially deplorable are the sections on the advised treatment for warts and worms, the explanation of cause of vomiting in infancy and on operations in children. Under the section on *Diseases,* it is stated that the Dick test will show the presence or absence of scarlet fever.

It would seem that the reason for such a book should be one of two—either a substitute for a physician in rural communities where no doctor or clinic is available, or as an adjunct to the private physicians' advice. No one book could properly serve both these purposes. This book does not fulfill the first, as the advice given is not systematized or practical for the type of mother who would need to use it (mothers whose children are subject to sinus infections are advised to take them to Florida or California). The second purpose is served in a few sections as mentioned previously, especially in regards to clothing, bath, and habit training, but for the most part, is a rather jumbled collection of hygienic, medical and laboratory notes. The Children's Bureau Publications, United States Department of Labor, puts out publications which serve this purpose much more satisfactorily.

It is our opinion that there is no justification for this book as it stands.

LOUISE FRY GALVIN, M. D.

Infant Nutrition. A Textbook of Infant Feeding for Students and Practitioners of Medicine. By WILLIAMS McKIM MARRIOTT, B. S., M. D., Professor of Pediatrics, Washington University School of Medicine; Physician in Chief, St. Louis Children's Hospital. Second Edition. St. Louis. The C. V. Mosby Company. 1935. Octavo of 431 pages. Illustrated. Cloth. Price, $4.50.

Chemistry is the foundation of pediatrics. Dr. Marriott, an outstanding pediatric chemist, is one of the pioneers in America to introduce chemistry into pediatrics.

Protein metabolism is treated chemically as it should be and the protein is easier to consider in infant feeding when its interlocking effect with other items are explained.

Carbohydrate metabolism is so important that fourteen pages are given to the many kinds of sugars and their change from one to another, when such changes occur. The carbohydrates of fruits are important additions.

Mineral and water metabolism occupy thirteen pages instead of being simply mentioned. This is a great advance in pediatrics.

Digestion in infants begins with salivary digestion. The acid base is considered and the pH of digestion given due consideration. Dr. Marriott is a pioneer in milk "Buffers" and the introduction of lactic acid milk has been large due to him. The chemistry of lactic acid milk is explained. Breast feeding of normal infants occupies twenty-seven pages. It is encouraging to see so much emphasis on breast feeding.

Fifty pages are devoted to the various forms of diarrhea. The miscellaneous technic for intravenous and intra-peritoneal injection are valuable to practitioner and hospital worker.

This book is valuable for practitioner and classroom.

ST. GEORGE T. GRINNAN, M. D.

XUM

Virginia Medical Monthly

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WYNDHAM B. BLANTON, M. D., *Editor*
AGNES V. EDWARDS, Richmond, *Business Manager*

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All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Monthly, 1200 East Clay Street, Richmond, Va.

This journal is not responsible for the opinions and statements of its contributors.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

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VOLUME 63 SEPTEMBER, 1936 No. 6

Editorial

Preaching What We Practice.

The National Medical Council on Birth Control was organized in June, 1936, for the purpose of controlling and supervising all medical policies of the American Birth Control League, as well as initiating, encouraging and executing appropriate scientific research in the medical aspects of birth control. Its headquarters are at 515 Madison Avenue, New York City.

On the council are a number of well-known medical men, William Allen Pusey, William E. Studdiford, Milton C. Winternitz, Hans Zinsser and J. Shelton Horsley. That birth control is approved by the medical profession of Virginia was shown in a poll conducted by the VIRGINIA MEDICAL MONTHLY a year or more ago. The economic future of our country is intimately tied up with this question which is bound to assume increasing importance among thinking people. It is a wise move to place this whole movement more directly under medical supervision.

Caesarean Section Before Caesar.

The operation of removing a living child from the womb of its dead mother was known to many ancient peoples including the Hindus, Hebrews and Romans. In ancient Rome such a procedure was required by law. In 1608 the Senate of Venice enacted a law imposing a severe penalty for failure to carry it out. It was not until 1500 A. D., however, that a Swiss sow gelder, Jacob Nufer by name, performed the first successful Caesarean operation upon a living mother. The patient was his wife and she later bore other children. Before the century was over Francis Rousset was able to collect no less than fifteen successful cases.

In a recent issue of the *Canadian Medical Association Journal*, John and Herbert Couch show that Julius Caesar was not born in this fashion, though until now the derivation of the phrase "Caesarean section" has been explained on the basis of this traditional fallacy. We have Pliny's word for it that "The first . . . of the Caesars [a grandfather of Julius] was so named, from having been removed by an incision in his mother's womb. For a similar reason, too, the Caesars were called by that name." Froude, the historian, tells us that Aurelia the mother of Julius Caesar did not die at his birth, as would have happened had her son been delivered in this manner. Caesar often referred to his mother and she lived in his house until she died in maturity. The first of the family, Sextus Julius Caesar, lived in Sicily about a hundred years before the birth of Julius. It was, therefore, this Sextus, and not Julius, who was delivered by incision into the womb of his dead mother,—from which it appears that a famous Roman family was named after the operation and not the operation after the family.

It Was Tried on Nero.

A recent news story in the *New York Times*, commenting on the increasing attention being paid in medical circles to the therapeutic possibilities of snake venom and on the extraordinary potency of the Russian viper's venom in particular, a million-million-millionths part of which is effective as a coagulant, reminds us that the facility of snake poison to arrest hemorrhage is not a modern discovery since it was known and tried in the ancient world. It directs attention to the fact that a Roman emperor, "the profligate and cruel Nero" to be exact, somewhere about the year A. D. 60 experienced an alarming hemorrhage which the court physician successfully arrested by the application of viper toxin.

Serum-Negative-Cerebrospinal-Fluid-Positive Wassermanns.

A positive cerebrospinal Wassermann in the presence of a negative serum Wassermann has been, of course, long recognized as an important clinical fact in neurosyphilis. As far back as 1910 Noguchi reported as high as 13 per cent of his cases of general paralysis giving these contradictory findings.

Only recently have satisfactory explanations of this situation been forthcoming. In a recent Public Health Service Publication there is abstracted a report of Otto S. Bier's article on *The mechanism of the Wassermann reaction positive in the spinal fluid and negative in the blood serum; part played by the fourth complement of the alexin in this phenomenon.* After carefully studying the various components of complement which might be responsible for negativizing an otherwise positive serum, Bier concluded that it was the so-called fourth component of complement (serum yeast) which was at fault. "It will require study of a large number of sera to show whether this inhibition is specific, whether it only represents an accentuated action of the anti-complementary capacity which the ammonia produces in the serum ,or whether it is a result of a condition of lability of the serum proteins."

By the addition of this fourth component to cerebrospinal fluid otherwise showing a four plus Wassermann reaction, negative results were gotten. It is suggested that "It is possible that by using 1 c.c. serum and inactivating it first with ammonia to avoid the disturbing action of the fourth component, reactions as intense as those in the spinal fluid may be obtained." The author feels that these theories do not exclude the possibility of the "local formation of reagins in the subarachnoid spaces."

A Contribution to History.

Percy Gatling Hamlin, M. D., M. C., is a Virginian. His recent book *The Making of a Soldier*, in which he has gathered and edited the letters of an important Confederate commander, R. S. Ewell, is entertaining reading. The VIRGINIA MEDICAL MONTHLY congratulates Dr. Hamlin upon this thoroughly worthwhile piece of work.

Ewell's letters, like most personal correspondence dashed off in unguarded moments, is often deeply revealing. Not only does this published correspondence throw light upon the character of Ewell, but it affords an uncensored commentary upon the times. And Ewell lived through some of the most interesting times in our national life.

The majority of these collected letters are written to his brother, Ben, and to his niece, Lizzie. The series begins at West Point, disclosing a young prospective officer of the United States Army troubled about his orthography, concerned over which branch of the service to enter, and firmly resolved to remain a bachelor all his life.

Bearing successively the postmarks of most of the frontier military forts, the letters continued to record graphically the life of an officer of the United States Dragoons. They tell of chasing Indians, of the hardships of military life, of speculations in gold mines. They breathe the hope of their writer's one day making enough money to retire from the army. These letters are interspersed with all sorts of advice to Lizzie,—including full directions on how to lose weight. The Mexican War interrupted this period of his life and the few letters written during the brief campaign below the Rio Grande throw important light upon some of the principal actors in that drama.

The later letters, those written as Confederate general, are on the whole disappointing. Perhaps it is too much to expect interesting detail in the personal correspondence of a busy commanding officer. In spite of occupying an important position under Jackson—whom, by the way, he did not seem to understand—he called him "an enthusiastic fanatic." In several of the letters we sense his admiration for Early. To him he writes: "Your claims to the Division are fully equal if not superior to mine." Highly successful in his early military operations,

XUM

be lived to see himself censured and ultimately removed from active command of his corps. His correspondence reflects his chagrin at this unhappy termination of his military career. Ill health and wounds appear to have been largely contributory. At first it was worry and indigestion, then malaria and the loss of a leg. Finally boils and neuralgia capped the climax.

The last period of Ewell's life, that of a Tennessee farmer, is reflected in letters full of the difficulties of post bellum agriculture in the South. They tell of wasted farms, lazy darkies, cotton that would not come up and corn that could not resist the cut worm.

If an estimate of Ewell is to be based upon these letters one arrives at the conclusion that they reveal a man who had experienced a full and interesting life. They are straightforward and never overserious. Some of them are delightful, with a pleasing vein of banter. On the other hand they are utterly devoid of emotion or of the philosophical approach to, or solution of life, although they were written in circumstances highly provocative of these characteristics. In spite of all that has been said concerning the eccentricity of Ewell, very little of this appears in his correspondence. He is here revealed as General Taylor who knew him well put it: "Virginia never bred a truer gentleman, a braver soldier, nor an odder, more lovable fellow."

President's Message

A Call to Our Staunton Meeting.

Less than six weeks remain before our annual meeting in Staunton. So far everything is moving alone smoothly.

Our local Committee on Arrangements informs me plans are in the shaping for ample space for scientific and commercial exhibits; that we will have good hotel accommodations; that the citizens of Staunton—the commercial organizations—are cooperating with the committee to give us everything in the way of entertainment we could desire.

The Chairman of the Committee on Scientific Exhibits advises that we will have an interesting display.

The Program Committee announces that the symposium will be most instructive; and the papers submitted are strong and interesting.

Now, it is up to us to make the meeting a success,—first, by attending, and enthusiastically entering into the whole spirit of the occasion.

There is a move to make the several alumni associations a feature of the meeting. Come and meet your old classmates, and talk about the old college days, and new problems. There is no way you can serve your alma mater better than by meeting fellow alumni, and discussing college matters—and I always believed the voice of the alumni should be leuder, and should be heard; and given credence by the faculties; board of visitors and trustees of the various colleges.

As to the Woman's Auxiliary, come and *bring* your wife, and your daughter. Don't send her, and you stay at home. The more women we have at these meetings, the more dignity we add to the occasion; the better papers we have, the greater success we will make of the whole meeting.

We are going to meet in, not a large city, but a beautiful one—full of historic interest, the birthplace of one of our greatest presidents. Let's go.

Sincerely yours,

P. ST. L. MONCURE,

President, Medical Society of Virginia.

Proceedings of Societies

The Northern Neck Medical Association

Held an excellent meeting at Warsaw, Va., on May 28th. In addition to a number of visitors, the following members were in attendance: Dr. Lee S. Liggan, president; Dr. E. T. Ames, secretary, and Drs. W. N. Chinn, R. E. Booker, G. H. Steuart, J. M. Holloway, E. R. Moorman, J. H. Hare, H. L. Segar, M. C. Oldham, G. B. Harrison, A. S. Lilly, C. T. Pierce, Samuel Downing, E. F. Gouldman, C. Y. Griffith, A. H. Deekens, and L. E. Cockrell.

The program included papers by Dr. J. H. Hare of Warsaw, Dr. C. Y. Griffith of Mount Holly, Drs. Carrington Williams, E. L. Kellum, A. I. Dodson, Donald Daniel of Richmond, and a lecture on Cancer and the showing of the Canti film by Dr. J. Shelton Horsley, also of Richmond. At this meeting, delegates were also elected to the State meeting to be held in Staunton.

The next meeting of this society will be held at Montross on October 22nd.

Augusta County Medical Association.

The annual meeting of this Association was held at Stonewall Jackson Tavern, just outside of Staunton, Va., on August 5th. Dr. William B. Porter of Richmond, professor of Medicine at the Medical College of Virginia, was the invited guest and presented an interesting paper at this time. Dr. J. C. Neale, the new Augusta County health officer, and Dr. Boyd H. Payne, both of Staunton, were elected to membership. Delegates were elected to the meeting of the State Society to be held in October and the following officers were named for the coming year: President, Dr. Guy R. Fisher, Staunton; vice-presidents, Dr. Glenn C. Campbell and Dr. Charles W. Rodgers, both of Staunton, and Dr. Hugh Bailey of Brownsburg; secretary, Dr. Alex. F. Robertson, Jr., and treasurer, Dr. T. M. Parkins,* both of Staunton and re-elected. The Society had its annual banquet following the meeting.

*Dr. Parkins died on August 10th as the result of an automobile accident on his way home from the meeting.

Fourth District Medical Society.

The regular meeting of this Society was held in Emporia, Va., on August 18th, with Dr. Frank Mallory of Lawrenceville presiding in the absence of the president, Dr. T G. Hardy, Farmville. Dr. Frank S. Johns, Richmond, was the invited guest for the afternoon program, and the following members also presented papers: Dr. J. B. Kiser, Emporia; Dr. C. E. Martin, Emporia; Dr. E. T. Terrell, Williamsburg; Dr. J. B. Jones, Petersburg; Dr. R. L. Raiford, Franklin; and Dr. H. C. Jones, Petersburg.

The evening program was a Testimonial Dinner to Dr. E. M. Parker, Emporia. The speakers were Dr. J. Morrison Hutcheson, Richmond; Dr. G. M. Naff and Dr. C. E. Martin, Emporia; and Dr. R. L. Raiford, Franklin.

The next regular meeting of this Society will be held in Chase City on November 10th.

Prince Edward County Medical Society.

At a recent meeting of this Society, delegate and alternate were elected to the Staunton meeting of the State Society and Dr. H. B. Holsinger, Farmville, was elected president, succeeding Dr. Thos. G. Hardy. Dr. Joseph H. Smith, Farmville, was re-elected secretary-treasurer.

Department of Clinical and Medical Education of the Medical Society of Virginia

Field Clinician Working in Virginia.

For four weeks beginning July 20th the Field Clinician of this department, Dr. L. L. Shamburger, has pursued work in the city of Suffolk, and in Nansemond and Isle of Wight Counties. During this time all doctors in the area have been visited at least once. In most cases several visits have been made and at the request of doctors consultations have been held some of which resulted in diagnosis and therapy. While most of the cases involved were obstetrical a considerable number were gynecological. Reports received during the course of Dr. Shamburger's work in this area indicate that there is considerable interest among the doctors in the venture and that it has been highly worth while. A final report has not been received at the writing of this item.

At the request of the Halifax Medical Society and with the support of the doctors in Greenesville and Brunswick Counties a joint post-graduate course in obstetrics and gynecology has been arranged for these counties for a period of five weeks beginning August 17th. Dr. Shamburger will spend two days each week at South Boston (Mondays and Tues-

XUM

days), Lawrenceville (Wednesdays and Thursdays), and Emporia (Fridays and Saturdays). In the afternoon of the first day in each place a clinic will be held for which all doctors in the counties are invited to enroll. The remainder of the time will be spent in individual or small group conferences by arrangement with doctors requesting such services.

Dr. Shamburger has accepted invitations to appear on the program of the Clinch Valley Medical Society on September 19th and on that of the Southwestern Virginia Medical Society on September 26th.

Following the five-weeks' course in Halifax, Brunswick and Greenesville Counties the Field Clinician will be available in other sections of the State upon request of local societies. Where local societies take the initiative, perfect an organization and make all arrangements for courses of lectures, clinics, and conferences no fees will be charged. If, however, a local society prefers that the Executive Agency of the Department, The Extension Division, send a representative to the county to interview doctors and make arrangements, this will be done but it will be necessary in this case to charge a small fee to those who enroll in order to cover the additional expenses of organization.

Societies wishing to avail themselves of the services of the Field Clinician for individual programs or extended courses should address their requests to the Executive Secretary of the Department, Mr. George B. Zehmer, University Station, Charlottesville, Virginia.

News Notes

Invitation to Staunton Meeting.

The Augusta County Medical Association, through Dr. Guy R. Fisher, its president and chairman of the Local Committee of Arrangements for our Staunton meeting, extends a most cordial invitation to the members of the Medical Society of Virginia to attention our sixty-seventh annual meeting in that city on October 13th, 14th and 15th. The local society is interested in doing everything possible for the comfort and pleasure of the doctors and the ladies accompanying them.

Our preliminary program appears in this issue of the MONTHLY. Be sure to look it over and be ready to discuss the papers in which you are especially interested. Many advances have been made in the treatment of the Endocrine Diseases in the past few years and so this was selected as the subject for general discussion. Dr. William D. Haggard, a past-president of the American Medical Association, will be the guest speaker at the first general session, and Dr. Lloyd W. Ketron, associate professor of dermatology at Johns Hopkins University, the other guest, will address the Society on Wednesday afternoon. Ample space has been provided for scientific as well as commercial exhibits.

So that this may not be "all work and no play," the Program Committee decided not to have a scientific session on Wednesday evening but to turn this into an informal social evening for alumni, fraternity and special society dinners. This will be a subscription affair. In addition to this, the Local Committee has arranged to have a "smoker" after the Tuesday evening session and a dance on Wednesday evening. Other entertainment has also been arranged for the ladies and the doctors are urged to bring their "better halves" along.

The business sessions—Council and House of Delegates—will start the ball rolling on Tuesday and members of these bodies are urged to be on hand as the business affairs are quite as important as the scientific and social.

Don't forget the dates—October 13th, 14th and 15th. Mark them on your calendar and make hotel reservations at once. Names of hotels with rates appeared in the April issue of the MONTHLY.

Changes Among Health Officers.

Dr. J. B. Porterfield, recently health officer of Montgomery County Health District, with headquarters at Christiansburg, Va., has been appointed head of the Peninsula Health Service, covering the counties of James City, Warwick and Elizabeth City, with offices in Williamsburg, Va. He succeeds Dr. George E. Waters who resigned to enter private practice.

Dr. Sheldon D. Carey, class of '35, University of Virginia Department of Medicine, who has been

assisting Dr. R. G. Beachley as deputy director of Rural Health in the State Health Department at Abingdon, has been appointed to succeed Dr. Porterfield.

New Commitment Papers for State Hospitals.

New commitment papers for the insane, inebriate and drug addicts have been sent out to Virginia's State Hospitals. These papers will protect the intimate details of the patient's life from curiosity seekers and gossipers, as only one copy will be made and this will be available only to medical authorities. The bare legal procedure is kept in the clerk's offices now and the more intimate report is sent to the hospital.

Married.

Dr. Samuel Weinstein and Miss Hollis Hayward Young, both of Richmond, Va., August 2nd.

Dr. William Hume Hoskins, class of '31, Medical College of Virginia, now of Venice, Fla., and Miss Elizabeth Braxton Henry Watson, Richmond, Va., August 22nd.

Dr. A. Lafayette Stratford and Miss Cary Valentine Cutchins, both of Richmond, Va., August 7th.

Dr. Joseph A. Robinson, Bluefield, W. Va., and Miss Elizabeth Arnold White, Tazewell, Va., August 1st. Dr. Robinson is an alumnus of the Medical College of Virginia, class of '33.

Dr. Munford Radford Yates, Lynchburg, Va., and Miss Frances Jones, daughter of Dr. and Mrs. J. Bolling Jones of Petersburg, Va., August 15th. Dr. Yates is a member of the medical class of '32 of the University of Virginia.

Dr. Archibald Perrin Hudgins, an alumnus of the University of Virginia, now located in Charleston, W. Va., and Miss Marie Hardy Linville, Linville, N. C., June 6th.

Dr. William Angle Young, of the class of '36, Medical College of Virginia, and Miss Margaret Maie Owens of Richmond, August 15th. Dr. Young is now interning at the Retreat for the Sick Hospital in Richmond, Va.

Dr. Warren F. Draper,

Formerly State Health Commissioner of Virginia, has been promoted and commissioned as Medical Director in the Regular Corps of the U. S. Public Health Service. This was effective July 23rd.

Dr. Hugh L. C. Wilkerson,

Class of '33, Medical College of Virginia, assistant surgeon in the U. S. Public Health Service, Reserve, is now stationed on the U. S. Coast Guard Cutter "Unalga" at San Juan, Puerto Rico.

New Ward Planned for Crippled Children's Hospital.

Plans have been drawn for a $45,000 ward for the care of crippled children affiicted with pulmonary and joint tuberculosis, to be added to the Crippled Children's Hospital in Richmond, Va. It is understood that an appeal will be made to the citizents of Richmond and the State to secure the amount needed in addition to that in hand so that this ward may be constructed at an early date. If the ward is built, it is stated that it will be known as the "William Tate Graham Ward," in recognition of the services of Dr. Graham, one of the founders who has given lavishly of his time without compensation.

The American Board of Internal Medicine (Inc.).

The American Board of Internal Medicine, incorporated February 28, 1936, completed its organization on June 15, 1936. Dr. Walter L. Bierring, Des Moines, was chosen Chairman, and Dr. O. H. Perry Pepper, Philadelphia, Secretary-Treasurer.

The organization of the board is the result of effective effort on the part of the American College of Physicians in conjunction with the Section on Practice of Medicine of the American Medical Association and these two organizations are represented in the membership of the board on a five to four ratio, respectively

The purpose of the board will be the certification of specialists in the field of internal medicine, and the establishment of qualifications with the required examination procedure for such certification.

While the board is at present chiefly concerned with the qualification and procedure for certification in the general field of internal medicine, it is intended to inaugurate immediately after July 1, 1937, similar qualification and procedure for additional certification in certain of the more restricted and specialized branches of internal medicine, as gastroenterology, cardiology, metabolic diseases, tuberculosis, allergic diseases, et cetera. Such special certification will be considered only for candidates

XUM

who have passed at least the written examination required for certification in general internal medicine. The operation of such a plan will require the active participation and cooperation of recognized representatives from each of such special fields of medicine.

The first written examination will be held in December, 1936, and candidates successful in this written test will be eligible for the first practical or clinical examination which will be conducted by members of the board near the time for the annual session of the American College of Physicians at St. Louis in April, 1937.

The fee for examination is forty dollars which must accompany the application and an additional fee of ten dollars is required when the certificate is issued.

Application blanks and further information can be obtained by addressing the office of the chairman, Walter L. Bierring, M. D., 406 Sixth Avenue, Des Moines, Iowa, U. S. A.

Lectures at Jefferson Medical College.

Sir David Wilkie, Professor of Surgery, Faculty of Medicine, University of Edinburgh, will give a series of twenty-five lectures at the Jefferson Medical College of Philadelphia during next November and December.

The Southside Virginia Medical Association

Is holding its regular quarterly meeting at Burkeville, Va., on Tuesday, September 8th and an interesting program has been planned as usual. Dr. L. S. Early, Petersburg, is president, and Dr. R. L. Raiford, Franklin, secretary-treasurer.

Dr. S. T. Ryang,

Class of '35, Medical College of Virginia, who later served a rotating internship at Memorial Hospital, Richmond, is now connected with the medical staff at Central State Hospital. Dr. Ryang received a certificate from the National Board of Medical Examiners in June.

Dr. Lewis W. Holladay,

For the past four years assistant surgeon at State Farm, Virginia, tendered his resignation as of September 1st and has moved to Dayton, Ohio, where he will be associated with Drs. C. A. and M. W. Coleman in the practice of urology. Their offices are at 970 Reibold Building.

Dr. Lester E. Dunman

Is located at Galax, Va., where he is resident physician to the Galax Hospital and Clinic. Dr. Dunman is a member of the class of '35, Medical College of Virginia, and interned at Memorial Hospital, Richmond.

Dr. Pauline Williams,

Richmond, Va., of the staff of the Medical College of Virginia, has been in New York City since the early summer pursuing special study in ophthalmology, but will return to Richmond in the Fall.

Dr. Williams was recently appointed chairman of the Women's Physicians of the Southern Medical Association for its meeting in Baltimore next November.

Health Officer of Staunton, Va.

Dr. Charles W. Rodgers has been elected health officer and coroner of Staunton, succeeding the late Dr. T. M. Parkins in both offices.

Dr. James Q. Gant,

Who graduated from the Medical College of Virginia in 1935 and later interned at Stuart Circle Hospital, Richmond, is now on the Dermatological Service at Bellevue Hospital, New York City.

Dr. John M. Bowden,

Of the class of '34, University of Virginia, Department of Medicine, recently stationed at the U. S. Marine Hospital, Mobile, Ala., has been appointed and commissioned as assistant surgeon in the Reserve Corps of the Public Health Service, effective August 1st.

New Infirmary for Negro Patients Near Completion.

The new $25,000 Negro infirmary for tubercular cases, now being erected at Pine Camp, Richmond's Municipal T. B. Sanitarium, is expected to be completed about the last of September. It will care for fifty-six patients, twenty-six of whom have been cared for at the City Home. The building will have separate wards for men and women and for boys and girls, as well as living quarters for the nurses. It will have its own kitchen, dining-room, and heating plant.

Dr. Leta J. White,

Petersburg, Va., has been appointed health chairman for the Federation of Business and Professional Women's Clubs of Virginia.

The International Medical Assembly of the Inter-State Post-Graduate Medical Association of North America

Will convene in St. Paul, Minn., on October 12th and continue through the 16th. Dr. David Riesman, Philadelphia, Pa., president, will preside. Pre- and Post-Assembly clinics will be held on the 10th and 17th in St. Paul Hospitals, with Drs. Edward W. Archibald, Montreal, Canada, and Charles H. Mayo and William J. Mayo, both of Rochester, presiding. A list of the teachers and clinicians appears on advertising page 2 of this issue of the MONTHLY.

A cordial invitation is extended to all members of the profession in good standing in their State or Provincial Societies. There is a registration fee of $5.00. Full information may be obtained from Dr. W. B. Peck, Managing-Director, Freeport, Ill.

The Medical Library Association,

At its annual meeting recently held in St. Paul, Minn., selected Richmond, Va., as the place for its 1937 meeting. Dr. William W. Francis of Montreal, Canada, was re-elected president, and Miss Janet Doe of New York City, was re-elected secretary.

Dr. H. Aurelia Gill,

Of Richmond, Va., and a member of the class of '35, Medical College of Virginia, has been appointed resident health officer and head of the department of biology of Mary Baldwin College, Staunton, Va. She has recently interned at the Hospital of the Woman's Medical College of Pennsylvania in Philadelphia.

Dr. R. S. Griffith,

Waynesboro, Va., was recently appointed Grand Senior Steward of the Grand Lodge, A. F. and A. M. of Virginia.

Dr. W. C. Webb,

Disputanta, Va., was appointed Prince George County's director under the new relief program, when entry into the State Welfare program was approved about the middle of August.

Dr. J. R. Tucker,

Williamsburg, Va., has been appointed chairman of the committee on rural-urban acquaintance of the Rotary Club of that place.

Dr. L. S. Early,

Petersburg, Va., has been selected a member of the executive committee of the Petersburg Post, American Legion, at a meeting the middle of August.

Dr. Neilson H. Turner,

Who was associated in practice for a number of years with Dr. J. A. White until the latter's retirement from practice recently, announces that he still has his office at 200 East Franklin Street, Richmond, Va., where he is continuing his practice in diseases of the eye, ear, nose and throat.

Dr. Thomas G. Faison,

Class of '32, Medical College of Virginia, recently with the C. C. Corps, has been appointed health officer of the Hertford County, N. C., new department of health.

Physician Wanted.

An excellent opportunity for a young well-qualified doctor who desires country practice. Address Mr. J. A. Moore, proprietor of the Peoples Prescription Pharmacy, Ferrum, Va.

A request has also come for a physician at Unionville, Va. Miss Nettie C Luck at that place will furnish information about the opportunities offered. (*Adv.*)

Wanted Location

For general practice or position in hospital. Have had experience in private practice and institutional work. Address "The Doctor," care this journal, 1200 East Clay Street, Richmond, Va. (*Adv.*)

Obituary Record

Dr. Meriwether Lewis Anderson,

Richmond, Va., died August 4th, after an illness of six weeks. He was born in Albemarle County, Virginia, in 1872, and graduated from the Medical College of Virginia in 1900. Dr. Anderson had practiced in Richmond since 1901 and was regarded as the dean of general practitioners in this city. He saw active service during the World War, being one of the first Richmond physicians to enlist. Dr. Anderson was a member of the Virginia Society of the Cincinnati, the Scottish Rite, the Royal Arcanum, and had been an active member of his local and State Medical Societies for many years. His wife and five children survive him.

Dr. Thomas M. Parkins,

Staunton, Va., died August 10th, following injuries received in an automobile accident. He was seventy years of age and a graduate of the College of Physicians and Surgeons, Baltimore, in 1894. Dr. Parkins had practiced in Staunton for thirty years and was city health officer and city coroner. He was treasurer of the Augusta County Medical Association, and had been a member of the Medical Society of Virginia for forty-two years. A daughter survives him.

Dr. Robert Whitehead,

Victoria, Va., died August 14th, after a short illness. A native of Amherst County, Virginia, he was forty-six years of age and a graduate of the former University College of Medicine, Richmond, in 1913. Dr. Whitehead practiced in Richmond for several years before moving to Victoria, several years ago. He had been a member of the Medical Society of Virginia for twenty-two years. His wife survives him.

Dr. William Burton DeGarmo,

Since 1897 a non-resident honorary member of the Medical Society of Virginia, died January 3rd at his winter home near Miami, Fla., as the result of a fall in which he fractured his left hip. He was a native of Wisconsin and eighty-seven years of age. Dr. DeGarmo graduated in medicine from the University of New York in 1875, and was professor of surgery at the New York Post-Graduate Medical School and Hospital from 1888 to 1921. He was a member of the New York State and other medical organizations and the author of several books. His wife and daughter survive him.

Dr. Jack Smiley,

Salem, Va., died early in July at the age of thirty-four years. He received his medical education at the Medical College of Virginia from which he graduated in 1926.

Upon the call of the President, the members of the Roanoke Academy of Medicine duly assembled, and the following resolutions were presented and adopted:

WHEREAS, in the passing from this life of our friend and colleague, Dr. Jack Smiley, BE IT RESOLVED:

First, that the members of the Roanoke Academy of Medicine deeply regret and hereby profess our profound sorrow at the untimely death of our friend and colleague.

Second, whereas, he has faithfully followed the practice of medicine in our community, giving himself and his time unstintingly to the poor and needy in their afflictions, we commend his unselfish service to mankind and extend to the bereaved family our heartfelt sympathy in their bereavement.

Third, that a copy of these resolutions be sent to Dr. Smiley's family, to the local newspaper and to the VIRGINIA MEDICAL MONTHLY.

GEO. D. JOHNSON,
H. H. WESCOTT,
W. M. OTEY,
Committee on Resolutions.

Dr. Richard Booker Easley,

Huntington, W. Va., died in Bellehaven, Va., August 13th. He was a native of Richmond, Va., and forty-one years of age. Dr. Easley graduated from the Medical College of Virginia in 1926, and practiced in Richmond for several years before moving to West Virginia. His wife and a son survive him.

Dr. Charles Harrison Frazier,

Of Philadelphia, internationally known neurological surgeon, died at his summer home in Maine on July 26th, at the age of sixty-six. He was John Rhea Barton, professor of surgery at his Alma Mater, the University of Pennsylvania, and was the recipient of many honors from European as well as American organizations.

Dr. Russell F. Hufford

Died at his home in Welch, W. Va., on May 19th, after a short illness. He was twenty-nine years of age and graduated from the Medical College of Virginia in 1932. He was a member of his local and State medical associations.

Dr. John Edgar Hubble,

Pomona, Calif., died July 30th, at the age of seventy-two. He was a native of Smyth County, Virginia, and received his medical degree from the University of Virginia in 1891. Prior to going to California about thirty years ago, Dr. Hubble practiced in Chilhowie, Va. His wife and six children survive him.

Dr. John Tilden Burrus,

High Point, N. C., a former president of the Medical Society of the State of North Carolina and of the North Carolina State Board of Health, died on June 8th, of coronary thrombosis and hypertension. He was the owner of the Burrus Clinic, held many positions of honor, and was connected with a number of medical organizations.